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April 15, 2022

Ms. Cynthia Wetmore
Environmental Engineer
US. EPA, Region IX
75 Hawthorne Street
San Francisco, California 94105

Subject: Data Collection Program, Operable Unit 1 Report,
Omega Chemical Corporation Superfund Site, Whittier, California

Dear Cynthia:

Per our discussions, enclosed is the Data Collection Program, Operable Unit 1 (OU1) Report, Omega Chemical Corporation Superfund Site, Whittier, California. The enclosed report provides a summary of the recently completed OU1 data collection program which was conducted during the period July 2021 and February 2022. The enclosed report should assist the USEPA/ACOE with the Five-Year Remedy Review and the effectiveness of the OU1 On-site Soil Remedy and OU1 Groundwater Removal Action.

We are available to answer any questions or provide additional information and look forward to reviewing the results of the EPA/ACOE team 5-year remedy review.

Sincerely,
Omega OU1/OU3 LLC

Edward Modiano
Omega OU1/OU3 LLC Manager

cc: Chip Poalinelli, USEPA
Jason Hermening, USEPA
Marlowe Laubach, ACOE
Chris Ross, Engineering Analytics Inc
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DATA COLLECTION PROGRAM
OPERABLE UNIT 1 REPORT
OMEGA CHEMICAL CORPORATION SUPERFUND SITE
WHITTIER, CALIFORNIA

Prepared for:

Omega Chemical Site

Potentially Responsible Parties Organized Group

Prepared by:

Engineering Analytics, Inc.

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Project No. 151090

April 14, 2022

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ACRONYMS AND ABBREVIATIONS

5YRR	5 year remedy review
bgs	Below ground surface
CD	Consent Decree
CDM Smith	CDM Smith, Inc (formerly Camp Dresser & McKee, Inc [CDM])
COC	Contaminants of Concern
1,1-DCE	1,1-dichloroethene
DPE	Dual Phase Extraction
EA	Engineering Analytics, Inc.
ECD	Electron Capture Detector
EE/CA	Engineering Evaluation/Cost Analysis
GCR	Groundwater Containment Remedy
ICs	Institutional Controls
ISVE1	Interim Soil Vapor Extraction System 1
MCL	Maximum Contaminant Level for drinking water
MIP	Membrane Interface Probe
NL	Notification Level
OPOG	Omega Chemical Site PRP Organized Group
OSS	On-Site Soil
OU1	Operable Unit 1, also referred to as the Phase 1a Area
OU2	Operable Unit 2
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
Site	Omega Chemical Corporation Superfund Site
SVE	Soil Vapor Extraction
PCE	Tetrachloroethene
RAO	Remedial Action Objectives
TCE	Trichloroethene
USEPA	United States Environmental Protection Agency
VMP	Vapor Monitoring Probe
VOCs	Volatile Organic Compounds

EXECUTIVE SUMMARY

This document was prepared by Engineering Analytics, Inc. on behalf of the Omega Chemical Site Potentially Responsible Parties Organized Group (OPOG) to present the results of the recently completed Operable Unit 1 (OU1) data collection program and to evaluate the progress of the On-Site Soil (OSS) remedy and groundwater containment remedy (GCR) for OU1 of the Omega Chemical Corporation Superfund Site, Whittier, California (Site). The results of the OU1 data collection program should assist USEPA in understanding the effectiveness of the OU1 OSS remedy and the GCR removal action to date and support the US Army Corps of Engineers in their preparation of the OU1 5-year remedy review report.

Background

In 2001, USEPA and OPOG entered into a Consent Decree to address soil and groundwater contamination on the Omega property and immediately downgradient.

In 2005, USEPA prepared a Removal Action Memorandum outlining the selection of the non-time critical removal action for groundwater. This document identified the main contaminants in groundwater and indicated that the primary goal of the removal action is to contain the highest levels of contamination dissolved in groundwater within OU1, so that they do not migrate and contribute to the downgradient Operable Unit 2 plume. Operation of the OU1 GCR was initiated in 2009. Since 2009 this system has been operated, monitored and optimized.

In 2008, USEPA prepared the Record of Decision (ROD) for OU1 Soils. The ROD identified eight primary contaminants of concern and presented three Remedial Action Objectives (RAOs). Operation of an interim soil vapor extraction (SVE) was initiated in June 2010 with operation of the OU1 OSS remedy starting in June 2015. Since 2010, the interim SVE system and OU1 OSS remedy have been operated, monitored and optimized.

In July 2021, the OU1 data collection program was initiated by OPOG as a voluntary effort to assess the current distribution and concentration of volatile organic compounds (VOCs) in former high concentration areas within OU1 to evaluate progress of the OU1 OSS remedy.

On-Site Soil Remedy

The OU1 OSS remedy has been designed, operated and optimized to maximize COC mass and concentration reduction in the unsaturated zone of OU1. The operation and optimization efforts have resulted in high COC concentration reductions in soil matrix and soil gas samples as observed during the OU1 data collection program. The distribution and magnitude of residual VOC mass with the OU1 unsaturated zone has been evaluated using multiple lines of evidence as follows:

- The current annual VOC mass recovery rate (approximately 4 pounds per year) represents less than 0.05 percent of the 9,705 pounds recovered as of the third quarter of 2021. This low rate of VOC mass recovery obtained during operation of the optimized OU1 OSS remedy is indicative that this system has reached asymptotic conditions.

- The relatively low VOC concentration rebound observed during the OU1 data collection in some soil gas monitoring locations and the absence of rebound in others indicates that high residual VOC mass does not exist near the monitoring locations.

- The recently collected soil matrix and soil gas samples indicate there has been substantial COC concentration reduction, on the order of 99 percent or greater, in the OU1 subsurface. Soil and soil gas samples collected from the shallow and deep soil indicate that there are no high residual concentration/mass areas remaining in these intervals. The COC concentration reduction in the shallow and deep soil indicates that the OU1 OSS remedy has been effective in treating the soil.

- Soil samples collected from the formerly saturated deep soil (between approximately 70 and 85 feet below ground surface) along with the membrane interface probe profiles indicate that there are no high residual concentration/mass areas remaining in this interval. The COC concentration reduction in this interval indicates that the OU1 OSS remedy has been effective in treating this zone.

The optimized OU1 OSS remedy has resulted in reductions in high soil matrix and soil gas concentrations as observed during the OU1 data collection program. As successful as these optimization efforts were in reducing the concentration of COCs in the soil, the OU1 OSS remedy SVE system mass recovery has reached asymptotic conditions with very low rates of mass recovery that continue to diminish with time. These observations are consistent with depleted subsurface mass and diffusion-limited mass partitioning and recovery.

Groundwater Containment Remedy

The results of the performance reviews presented in quarterly reports have indicated that the GCR has been effective in achieving containment of the high concentrations of VOCS in OU1 from migrating into OU2. The existing GCR removal action is a containment remedy. Nonetheless, the combined OU1 GCR and OSS remedy have substantially reduced COC mass and concentrations in OU1 groundwater.

1.0 INTRODUCTION

This document was prepared by Engineering Analytics, Inc. (EA) on behalf of the Omega Chemical Site Potentially Responsible Parties Organized Group (OPOG) to present the results of the recently completed Operable Unit 1 (OU1) data collection program and to evaluate the progress of the soil remedy and groundwater removal action for OU1 of the Omega Chemical Corporation Superfund Site, Whittier, California (Site) (Figure 1).

1.1 Objective

In early 2021, OPOG engaged the United States Environmental Protection Agency (USEPA) regarding the OU1 data collection program. The objectives of the OU1 data collection program were outlined in a Technical Memorandum provided to the USEPA in March 2021 (de maximis, Inc. 2021 and EA, 2021). The objectives outlined in the March 2021 Technical Memorandum that are relevant to this report include:

- Collect soil matrix and soil gas concentration data to evaluate soil vapor extraction (SVE) remediation progress.
- Determine the current distribution of residual volatile organic compound (VOC) mass/concentrations in former high concentrations portions of the unsaturated and saturated zones.

In April 2021, OPOG requested USEPA concurrence on the planned temporary shutdown of the OU1 On-Site Soil (OSS) SVE system and groundwater containment remedy (GCR) to allow the OU1 data collection program to proceed (OPOG, 2021). USEPA subsequently approved the request (USEPA, 2021).

In January 2022, USEPA indicated that the USEPA, with support from the US Army Corps of Engineers, is preparing a 5-year remedy review (5YRR) report for the OU1 soil remedy and groundwater removal action. The USEPA 5YRR team indicated that it would be helpful for OPOG to present the results of the recently completed OU1 data collection program to assist in further understanding the effectiveness of the soil remedy and groundwater removal action.

1.2 Background

In February 2001, USEPA and OPOG entered into a Consent Decree (CD) to address soil and groundwater contamination on the Omega property and immediately downgradient (USEPA, 2001).

The soil component of the 2001 CD was conducted through the remedial investigation/feasibility study (RI/FS) process in 2007/2008 (CDM, 2007 and 2008) and was memorialized with EPA's issuance of the Record of Decision (ROD) in 2008 (USEPA, 2008). The ROD identified eight primary contaminants of concern and described the Remedial Action Objectives (RAOs). The primary RAO's were to reduce or eliminate the vapor intrusion risk associated with VOC vapors in contaminated soils and reduce or eliminate the risk associated with direct exposure to, contact with, and/or ingestion of contaminated soils. In late 2010, USEPA and OPOG entered into CD 10-05051 to design and construct the OU1 OSS remedy.

In parallel, the groundwater component of the 2001 CD was conducted through the Engineering Evaluation/Cost Analysis (EE/CA) process which was memorialized with EPA's issuance of the 2005 Removal Action Memorandum. The Removal Action Memorandum identified the main contaminants in groundwater and indicated that the primary goal of the removal action is to contain the highest levels of contamination dissolved in groundwater within OU1, so that they do not migrate and contribute to the downgradient Operable Unit 2 (OU2) plume. Operation of the OU1 GCR was initiated in 2009. For the purposes of this document, the term OU1 GCR will be used when referencing the Phase 1a groundwater containment system.

1.2.1 OU1 On-Site Soil Remedy

In 2007, the OSS RI report documented soil assessment activities and pilot SVE testing that were completed on and in the vicinity of the former Omega Chemical Property in 2007. The OSS FS report was completed in 2008 (CDM, 2008).

The distribution of VOCs in soil matrix prior to remediation was evaluated as part of the RI. Tetrachloroethene (PCE) is a good surrogate for VOCs and contaminants of concern (COCs) at the Site because it was identified as the dominant risk driver within OU1 prior to remediation and remains the dominant COC detected in recent soil matrix and soil gas samples. PCE concentrations in soil matrix prior to remediation were highest in the northwest portion of the former Omega Chemical Property (west side of Star City Auto Body, Figure 2). Higher concentrations of PCE in soil matrix in deep soil (greater than 30 feet below ground surface [bgs]) extended from the northwest side of the former Omega Property to the west. The distribution of PCE in soil gas was similar, but more diffuse than soil matrix (Figure 3). The concentrations of trichloroethene (TCE) in soil gas and soil matrix were generally an order of magnitude lower than PCE concentrations in these media.

The ROD (USEPA, 2008) identified eight primary COCs as follows: PCE, TCE, 1,1-dichloroethene (1,1-DCE), 1,1,1-trichloroethane, 1,2-dichloroethane, cis-1,2-dichloroehene, trans-1,2-dichloroethene and Freon 11. The ROD presented three RAOs for OU1 soils (Table 1):

- Reduce or eliminate the vapor intrusion risk associated with VOC vapors in contaminated soils.
- Reduce or eliminate the risk associated with direct exposure to, contact with, and/or ingestion of contaminated soils.
- Reduce or eliminate contaminant migration to groundwater to levels that protect the groundwater resource.

The ROD selected alternative 2, which consisted of SVE, partial capping and short-term institutional controls (ICs). The estimated overall duration of the remedy, from design to closure, was seven years, five of which were for operating the SVE system. The selected alternative included the following optimization efforts as described in the ROD: altering the wellhead pressures and adding extraction wells and/or passive injection wells. Potential additional optimization efforts included using hot air injection and/or addition of dual-phase extraction (DPE) wells. As part of the selected remedy, ICs would be implemented to require that the existing pavement be maintained during the operation of the SVE system.

While USEPA and OPOG were negotiating the 2010 CD for implementing the ROD Selected Alternative 2, an Administrative Order on Consent was signed in November 2009 as a short-term removal action to address elevated indoor air VOC levels at two USEPA-identified buildings within OU1, Terra Pave and Bishop. Construction of the interim SVE system (also referred to as ISVE1) was completed in May 2010. On June 14, 2010, full time continuous operation of the interim SVE system started. In late 2010, under CD No. 10-05051, USEPA instructed OPOG to design and construct the OU1 OSS remedy. During the first year of interim SVE system operations there were modifications and expansions of the system as well as installation of vapor monitoring probes (VMPs). In 2011, there were additional pilot SVE tests conducted on deep SVE and DPE wells to support the design of the OU1 OSS remedy. By November 2014, the OU1 OSS remedy construction was complete which included the installation of DPE wells. In June 2015, full time continuous operation of the OU1 OSS remedy was started. The interim SVE system and OSS remedy has been optimized throughout the period of operations (Table 2). The current configuration of the OU1 OSS remedy is illustrated in Figure 4. In April 2018, the 2018 OU1 OSS remedy Precertification/Final Certification Inspections were completed (CDM Smith, 2018), and on May 9, 2019 USEPA approved the Remedial Action Construction Completion Report for the OU1 OSS remedy (USEPA, 2019).

ICs have not been formally recorded; however, OPOG has been actively engaged with property owners within OU1 and have made pavement repairs whenever needed to control direct exposure to soil. In addition, the OU1 staff who operate OSS remedy and GCR also monitor conditions to ensure pavement is in good condition.

1.2.2 OU1 Groundwater Removal Action

OPOG prepared an EE/CA in 2005 to evaluate the removal action for the OU1 GCR (CDM, 2005). In September 2005, USEPA prepared a Removal Action Memorandum outlining the selection of the non-time critical removal action (USEPA, 2005). There were two groundwater RAOs presented in the EE/CA, the first of which was clarified in the Removal Action Memorandum (Table 1):

- To contain the highest levels of contamination dissolved in groundwater within OU1, so that they do not migrate and contribute to the downgradient OU2 plume.
- Meet air emission and water treatment standards associated with the treatment and/or reuse of extracted groundwater.

The main contaminants in groundwater identified in the Removal Acton Memorandum were chlorinated hydrocarbons (primarily PCE, TCE and 1,1-DCE), freons and 1,4-dioxane. The highest concentrations of these compounds were detected near the water table and decreased rapidly with depth (Figures 5a and 5b). As stated in Removal Action Memorandum, the primary goal of the removal action is to contain the highest levels of contamination dissolved in groundwater within OU1, so that they do not migrate and contribute to the downgradient OU2 plume. To achieve the containment RAO, the GCR included five groundwater extraction wells installed within the Putnam Street right of way to form a hydraulic barrier along the primary flow pathway for downgradient contaminant migration.

In 2009, OPOG initiated operation of the OU1 GCR to extract and treat OU1 groundwater from five extraction wells located on Putnam Street (EW-01 to EW-05, Figure 6). In 2011, DPE pilot testing was conducted as part of the OU1 OSS remedy to evaluate the potential for improving COC mass recovery of the OU1 OSS remedy by adding DPE wells. In 2015, DPE wells were connected to the OU1 GCR and in 2017 deep SVE wells VE-7D and VE-10D were also connected to the GCR and operated as DPE wells. Periodic groundwater performance/remedy review reports have been prepared by OPOG consultants since the GCR became operational and are currently prepared on a quarterly basis.

1.3 OU1 Data Collection Program

The OU1 data collection program was initiated in July 2021 and completed in February 2022. The methods and procedures utilized during the data collection program have been summarized (Appendix A).

Membrane Interface Probes (MIP) profiles, collection of soil samples from soil borings, and soil gas samples were collected during the OU1 data collection program to evaluate the OU1 OSS remedy progress and to determine the current distribution of residual VOCs in formerly high concentration areas of OU1.

MIP profile data were used to evaluate the relative change in MIP measurements due to operation of the OU1 OSS remedy by comparing pre-remediation MIP profiles obtained during the RI at the Site with MIP profiles obtained during the recent OU1 data collection program in 2021. In addition, the MIP profiles were also reviewed prior to soil sample collection at each planned adjacent soil boring to select the soil sample intervals. Five MIP locations (Figure 7a) were selected based on a review of the RI MIP profiles.

Eleven soil borings were advanced early in the OU1 data collection program (Figure 7a). Ten of the soil borings (all but SB-2104) were located in areas that had relatively higher concentrations of VOCs based on pre-remediation shallow and deep soil samples collected during the RI. These soil borings were advanced to assess current conditions in the areas that previously contained relatively higher VOC mass, and which could potentially affect remedial effort, optimization, and performance decisions. The remaining soil boring, SB-2104, was located adjacent to a previous MIP location MIP-2102, to provide quantitative soil sample laboratory analytical data for comparison to the adjacent MIP qualitative data.

The potential rebound or change in soil vapor VOC concentrations over time was evaluated by collecting soil gas samples from SVE and DPE wells and VMPs while the OU1 OSS SVE system was off (Figure 7b). The rate and magnitude of soil gas VOC concentration rebound measured during static tests provides an indication of the presence of residual mass in proximity to each test location and an indication of the ability of the OU1 OSS remedy to attain performance goals. The rate and magnitude of soil gas concentration change during dynamic rebound testing provides information on the VOC conditions in more permeable zones in the vicinity of the SVE/DPE wells and on potential optimization measures through cycled operation of these wells.

2.0 CURRENT CONDITIONS AND REMEDIAL ACTION OBJECTIVES

The data collected during the OU1 data collection program provides an indication of current soil and soil gas conditions. Groundwater samples collected from wells within OU1 since the beginning of 2020 provide information on recent groundwater conditions. These data, collectively referred to as recent data, have been compared to the RAOs established for the OU1 OSS remedy and the OU1 groundwater removal action, where applicable, to assess the progress of the removal action/remediation efforts to date.

2.1 OU1 On-Site Soil Remedy

There were three RAOs established as part of the ROD (Table 1). The following subsections summarize current COC concentrations in comparison to established OU1 ROD cleanup levels. The pre-remediation COC concentrations have also been summarized to provide context as to the progress of the OU1 OSS remedy.

2.1.1 Vapor Intrusion RAO

To evaluate the RAO of "Reduce or eliminate the vapor intrusion risk associated with VOC vapors in contaminated soils," there were eight primary COCs with established shallow soil gas cleanup levels (Table 1). Shallow soil was defined as occurring from ground surface to 30 feet bgs (USEPA, 2008). For purposes of comparison, the following information has been compiled (Table 3):

- The maximum pre-remediation shallow soil gas concentration.
- The minimum and maximum soil gas concentrations and the number of locations where soil gas samples were collected from shallow soil during the OU1 data collection program.
- The soil gas cleanup levels presented in the ROD.

PCE was the only compound detected exceeding the ROD soil gas cleanup level, which occurred at 6 of the 35 sample locations (Table 3). The recent data indicate that there has been substantial progress towards attaining ROD soil gas cleanup levels, which are based on a hypothetical residential receptor, even though the area was and continues to be used for commercial/industrial purposes.

2.1.2 Direct Exposure to Soil RAO

To address the RAO of "Reduce or eliminate the risk associated with direct exposure to, contact with, and/or ingestion of contaminated soils," PCE was the sole primary COC that had a ROD established soil matrix cleanup level for direct exposure to shallow soil (Table 1). Shallow soil was defined as occurring from ground surface to 30 feet bgs (USEPA, 2008). The ROD referenced a 12-foot exposure scenario for soil (Table 1 of ROD). For purposes of comparison, the following information have been compiled (Table 4):

- The maximum pre-remediation shallow soil matrix concentration.
- The minimum and maximum soil matrix concentrations and number of soil samples collected from the shallow soil (upper 30 feet) during the OU1 data collection program.
- The soil matrix cleanup level presented in the ROD.

PCE was the only primary COC with a ROD cleanup level for shallow soil; the recent maximum PCE concentration is well below the ROD cleanup level (Table 4). Based on the results of recent soil matrix samples, the ROD cleanup level for PCE has been achieved for direct contact with soil.

2.1.3 Groundwater Protection RAO

The groundwater protection RAO is "Reduce or eliminate contaminant migration to groundwater to levels that protect the groundwater resource." The ROD did not specify cleanup levels for soil that would be protective of underlying groundwater.

2.2 OU1 Groundwater Removal Action

As stated in Removal Action Memorandum, the primary goal of the groundwater removal action is to contain the highest levels of contamination dissolved in groundwater within OU1, so that they do not migrate and contribute to the downgradient OU2 plume. As presented in the EE/CA there was an additional goal for the GCR which was to "meet air emission and water treatment standards associated with the treatment and/or reuse of extracted groundwater."

The performance of the OU1 groundwater removal action has been assessed on at least a quarterly basis since the GCR system became operational in 2009. The results of the performance reviews, which have been provided to USEPA, have indicated that the GCR has been an effective containment remedy. While mass reduction is not an action for the GCR; for comparative purposes the groundwater concentrations have been significantly reduced during the operation of this system have been provided (Table 5).

3.0 SUMMARY OF DATA EVALUATION FINDINGS

The recently obtained information from the OU1 data collection program have been evaluated to determine the current distribution of residual VOCs in former high concentration portions of OU1. In addition, these data in combination with mass recovery and previously collected data within OU1 have been used to evaluate OU1 remediation progress.

3.1 Onsite Soil Remedy

The OU1 OSS remedy has been designed, operated and optimized to maximize COC mass and concentration reduction in the unsaturated zone of OU1. The concentration reduction based on recent soil matrix data indicates that the ROD cleanup level has been achieved for direct contact with soil (Section 2.1.2). The concentration reduction in soil gas based on recent soil gas samples indicates that PCE was the only compound detected exceeding the ROD soil gas cleanup level, which occurred at 6 of the 35 sample locations (Section 2.1.1).

The distribution and magnitude of residual VOC mass with the OU1 unsaturated zone has been evaluated using multiple lines of evidence as follows:

- The total COC mass recovered and the current rate of mass recovery of the OU1 OSS remedy. The ratio of current mass recovered during a year to the total mass recovered by the OU1 OSS remedy SVE system provides an indication that asymptotic COC mass removal conditions have been reached.
- The rebound in PCE concentrations in soil gas samples collected during the OU1 data collection program. The rate and magnitude of rebound provides an indication of the residual mass within the vicinity the respective sample locations.
- The measured concentrations of PCE in soil matrix and soil gas samples collected from shallow and deep soil. The distributions of PCE in recent soil matrix and gas samples compared to the distributions of pre-remediation concentrations provides an indication of depths/areas where the OU1 OSS remedy may have been less effective. The presence of localized recalcitrant higher concentration areas, to the extent identified, also provides an opportunity for future targeted enhancements to the OU1 OSS remedy.
- The measured concentrations of PCE in soil matrix and MIP profiles obtained from the formerly saturated portion of OU1. The formerly saturated portion of OU1 is between the high water table observed in the 1990's (70 feet bgs) and the current water table, which is near the historical low (85 feet bgs). The PCE in soil matrix and MIP profile data provide an indication as to whether the OU1 OSS remedy has effectively reduced COC concentrations in this formerly saturated interval.

As will be presented in more detail in the following subsections, the optimized OU1 OSS remedy has resulted in reductions in high soil matrix and soil gas concentrations as observed during the OU1 data collection program. As successful as these optimization efforts were in reducing the concentration of COCs in the soil, the OU1 OSS remedy SVE system mass recovery has reached asymptotic conditions with very low rates of mass recovery that continue to diminish with time.

These observations are consistent with depleted subsurface mass and diffusion-limited mass partitioning and recovery.

3.1.1 Mass Recovery

The optimized OU1 OSS remedy has recovered approximately 9,705 pounds of VOCs since 2010 (Figure 8). The OU1 OSS remedy mass recovery rate has been at near asymptotic conditions since about 2018. Currently the OU1 OSS remedy is recovering approximately 1 pound of VOCs per quarter or 4 pounds per year. The current annual VOC mass recovery rate represents less than 0.05 percent of the total mass recovered to date. This low rate of mass recovery obtained during operation of the optimized OU1 OSS remedy is indicative that this system has reached asymptotic conditions.

3.1.2 Soil Gas Rebound

Soil gas rebound sampling was conducted over a 6-month period during the OU1 data collection program. The rebound sampling included collection of soil gas samples when the OU1 OSS remedy SVE system was not extracting vapor (static sampling) and sampling of selected SVE wells during an 8-hour period while soil vapor extraction occurred (dynamic sampling). The rate and magnitude of soil gas VOC concentration rebound measured during static tests provides an indication of the presence of residual mass in proximity to each test location and an indication of the ability for the OU1 OSS remedy to attain performance goals. The rate and magnitude of soil gas concentration change during dynamic rebound testing provides information on the VOC conditions in more permeable zones in the vicinity of the SVE/DPE wells and potential optimization measures through cycled operation of these wells.

Soil gas rebound analysis is complicated by the typical VOC concentration variability measured at a vapor extraction well or vapor monitoring probe over time. The VOC concentration variability was addressed by evaluating the range in PCE concentrations measured at each sample location during the "baseline" period. The baseline period was determined to be between July 2018 and July 2021 because the total VOC mass recovery leveled off, and PCE concentrations were relatively stable within this time frame. Baseline data from each well or probe were used to determine the pre-rebound minimum, maximum, range, and geometric mean PCE concentrations (Table 6). To characterize concentration rebound at each location the maximum PCE sample result during the six-month rebound period ("rebound sample") was compared to the baseline period sample results using data from each sample location. Concentration rebound at each location was assigned one of three categories, likely increase, no change, or likely decrease based on the following criteria (illustrated in Figure 9):

- If the rebound sample was greater than the maximum baseline result, then a "Likely Increase" determination was assigned to the sample location;
- If the rebound sample results were within the range of baseline sample results for the respective SVE/DPE well, a "No Change" determination was assigned to the sample location; or
- If the rebound sample result was less than the minimum baseline result, then a "Likely Decrease" determination was assigned to the sample location.

The relatively low VOC concentration rebound observed during the OU1 data collection in some soil gas monitoring locations and the absence of rebound in others indicates that high residual VOC mass does not exist near the monitoring locations (Table 6, Figures 10a and 10b). In the shallow soil, 11 locations exhibited a 'likely increase', 18 exhibited 'no change', and 3 exhibited 'likely decrease' in PCE concentrations during the rebound period. The locations with likely increase trends are evenly distributed throughout OU1 with soil vapor PCE concentrations ranging from 74 to 1,700 µg/m^3. The locations with no change trends are evenly distributed throughout OU1 with soil vapor PCE concentrations ranging from 10 to 1,400 µg/m^3. The locations with likely decrease trends are all located near the OU1 boundary, and PCE concentrations were less than 100 µg/m^3. In deep soil, seven locations exhibited likely increase trend and the remaining six locations exhibited no change trends. No locations exhibited a likely decrease trend. PCE concentrations ranged from 65 to 5,600 µg/m^3 at locations with a likely increase trend, and 33 to 3,500 µg/m^3 at locations with no change trend. Both the likely increase and no change trends are relatively evenly distributed throughout the Site.

Based on the low soil gas concentrations observed during dynamic rebound testing, cycling of the OU1 OSS remedy SVE system is not expected to result in brief periods of relatively higher mass recovery. Such periods can occur when there is relatively high residual mass in more permeable zones, but that is not expected to be the case here given the lack of observed concentration rebound and the absence of high mass/concentration areas identified during recent soil sampling (Section 3.1.3).

3.1.3 Soil Matrix and Soil Gas in Shallow and Deep Soil

The recently collected soil matrix and soil gas samples indicate there has been substantial concentration reduction, on the order of 99 percent or greater, in the OU1 subsurface. When comparing maximums, the COC concentrations detected in soil matrix and soil gas samples collected prior to initiating remediation were much higher, often hundreds to over thousands of times greater, than samples collected during the recent OU1 data collection program (Tables 7a and 7b). Overall comparisons of maximum concentrations of primary COCs in shallow and deep soil and soil gas also indicate similar reductions (Tables 8a and 8b).

Comparisons of current maximum PCE soil matrix concentrations to pre-remediation concentrations in specific depth intervals indicate a similar reduction, especially in areas where pre-remediation concentrations were most elevated. The greatest pre-remediation PCE concentrations in soil were detected in the upper 10 feet in the northwest portion of the former Omega Property (Figure 11a). Within the deep soil, near the former higher water table (in the 60-to-70-foot depth interval,Figure 11b), there was a zone that extended from the northwestern portion of the Former Omega Property to the west on Putnam Street where all soil samples exceeded 10,000 µg/kg. The current PCE concentrations are much lower than pre-remediation levels, with the maximum PCE concentration detected at 47 µg/kg in the shallow soil on the northwest portion of the Former Omega Property (Figure 12a). The current concentrations of PCE generally are less than 1 µg/kg outside of the northwest portion of the Former Omega Property, with the exception of some 1 to 10 µg/kg PCE concentrations in deeper soil to the west (Figure 12b). Current PCE concentrations are substantially reduced compared to pre-remediation concentrations.

A more direct comparison of PCE concentrations in pre-remediation soil samples to current soil samples collected from proximal borings indicate a similar order of magnitude in concentration reduction (Figure 13 and Table 9). The concentrations of PCE in these soil samples indicated an average concentration reduction of approximately 99 percent (Table 10).

Soil and soil gas samples collected from the shallow and deep soil indicate that there are no high residual concentration/mass areas remaining in these intervals. The concentration reduction in COCs in the shallow and deep soil indicates that the OU1 OSS remedy has been effective in treating the soil.

3.1.4 Soil Matrix and MIP Profiles Formerly Saturated Interval

The water table in OU1 has generally declined since the mid 1990's. The high and low water tables since this time are illustrated on Figure 5b. The high water table was approximately 70 feet bgs, with the current conditions near the historical low water table, which is approximately 85 feet bgs. The area between the high and low water table is referred to as the formerly saturated deep soil.

The PCE groundwater concentrations at the water table prior to initiating the GCR removal action, were as high as approximately 170,000 micrograms per liter (µg/l) (Table 5). As the water table declined and soil and groundwater remediation progressed, the concentrations of PCE in groundwater at monitoring wells throughout OU1 also declined. Recent PCE concentrations have declined to a maximum of approximately 1,500 µg/l (Table 5). The OU1 data collection program included soil sample collection within the formerly saturated deep soil and installation of MIP probes to assess whether the relatively high concentrations of PCE observed during higher groundwater conditions remains elevated or whether existing OU1 OSS remedy has treated this interval.

The recently collected soil matrix samples indicate there has been substantial concentration reduction in the formerly saturated deep soil (Table 8a). The PCE concentrations in recently collected soil samples in the 70-to 80-foot interval were low, generally non-detect or less than 1 µg/kg with an isolated area less than 10 µg/kg (Figure 12c).

The MIP profiles were advanced to 90 feet or the depth of refusal. Five MIP probes were advanced in the general vicinity of MIP probes previously advanced during the RI. The results of photoionization detector and electron capture detector (ECD) logs from the recent and previous nearby RI MIP locations were compared. The ECD readings for the RI MIPs either had elevated concentration readings at depths starting near 30 to 60 feet bgs or in one case had elevated concentrations from near ground surface to the total depth (MIP3, Figure 14). The recent ECD logs indicate a relatively uniform baseline with few elevated readings with two MIP locations extending to near 90 feet bgs.

In addition, the concentrations of PCE and total VOCs were compared at a MIP location where both soil matrix and soil vapor data were collected recently (Figure 14). The soil and soil gas results at this MIP location corroborate the interpretation that the relatively steady and low ECD readings are indicative of low residual VOC concentrations.

Soil samples collected from the formerly saturated deep soil, along with the MIP profiles indicate that there are no high residual concentration/mass areas remaining in this interval. The concentration reduction in COCs in this interval indicates that the OU1 OSS remedy has been effective in treating this zone.

3.2 Groundwater Containment Removal Action

The results of the performance reviews presented in quarterly reports, which have been provided to USEPA, have indicated that the GCR has been effective in achieving containment of the high concentrations of VOCS in OU1 from migrating into OU2.

The existing GCR removal action is a containment remedy. Nonetheless, the combined OU1 GCR and OSS remedies have substantially reduced mass and concentrations in OU1 groundwater as documented in the quarterly performance standard verification plan reports. As of the second quarter of 2021, approximately 990 pounds of VOCs have been recovered from approximately 48.8 million gallons of extracted groundwater (Figure 15). The concentration of VOCs and 1,4-dioxane detected in pre-removal-action and recent groundwater samples has been summarized (Table 5). Like the soil and soil gas samples, there has been substantial reduction in concentrations observed in groundwater resulting from the GCR removal, with the four of the six main contaminants remaining above the maximum contaminant level for drinking water (MCL) or California notification level (NL) (PCE, TCE, 1,1-DCE above respective MCLs of 5, 5, and 6 μg/l; and 1,4-dioxane above the NL of 1 μg/l). Comparison of maximum pre-removal versus maximum recent groundwater concentrations for these four compounds indicates that there has been an approximate 99 percent reduction in groundwater concentrations.

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TABLES

Table 1. Operable Unit 1 Remedial Action Objectives

Media	Remedial Action Objective (RAO)	Compound(s)	Concentration	Source Document(s)
Soil	Reduce or eliminate the vapor intrusion risk associated with VOC vapors in contaminated soils. This RAO applies to upper vadose zone soil, from ground surface to 30 feet.	1,2-Dichloroethane	83 ug/m3	ROD based on de minimus risk (10-6 cancer risk) and unrestricted land use (residential)[2]
		1,1-Dichloroethene	110,000 ug/m3	
		cis-1,2-Dichloroethene	22,000 ug/m3	
		trans-1,2-Dichloroethene	45,000 ug/m3	
		Tetrachloroethene (PCE)	470 ug/m3	
		1,1,1-Trichloroethane (TCA)	1,300,000 ug/m3	
		Trichloroethene (TCE)	1,300 ug/m3	
		Freon 11	390,000 ug/m3	
	Reduce or eliminate the risk associated with direct exposure to, contact with, and/or ingestion of contaminated soils This RAO applies to upper vadose zone soil, from ground surface to 30 feet[1].	Tetrachloroethene was major risk driver	1,200 ug/kg	ROD based on de minimus risk (10-6 cancer risk) and unrestricted land use (residential)[2]
	Reduce or eliminate contaminant migration to groundwater to levels that protect the groundwater resource	To be determined		
Ground-water	Provide horizontal and vertical containment within the OU1 (Phase 1a Area) of groundwater contamination associated with the Omega property	Focus was on main contaminants in groundwater (Tetrachloroethene, Trichloroethene, 1,1-dichloroethene, freons and 1,4-dioxane	Contain the highest levels of contamination dissolved in groundwater within OU1	EE/CA and Removal Action Memorandum
	Meet air emission and water treatment standards associated with the treatment and/or reuse of extracted groundwater	As applicable in air and water discharge	As applicable in air and water discharge	EE/CA

[1] The ROD indicates direct contact was applicable to shallow soil, upper 30 feet. From a practical matter, direct contact is normally associated with shallower soil (upper 10 to 12 feet). It should be noted that the ROD referenced a 12 foot exposure scenario for soil (Table 1 of ROD).

[2] Current use is commercial/industrial, and City of Whittier July 2021 Draft General Plan does not include residential use in this area.

ROD = Record of Decision (USEPA, 2008) EE/CA = Engineering Evaluation and Cost Analysis (CDM, 2005)
Removal Action Technical Memorandum (USEPA, 2005)
ug/kg = micrograms per kilogram ug/m3 = micrograms per cubic meter

Table 2 - Soil Remedy Optimization Efforts

Date	Activity	Result
2006 and 2007	SVE Pilot Testing and Extended Pilot Testing	Pilot testing resulted in removal of over 1,200 pounds of VOCs from the subsurface
March to June 2010	Construction and inspection of interim SVE system (ISVE1)	
June 14, 2010	Startup of ISVE1	
September and October 2010	Expansion of the ISVE1 to include three new VEWs: VE-6S, -14S, and -15S	Additional mass removal along Whittier Boulevard
April 2011	Replacement of ISVE1 blower skid with a larger blower skid	SVE flow capacity was more than doubled (from 600 to 1,280 standard cubic feet per minute)
May - August 2011	DPE Pilot Testing, including installation of deep SVE wells, VMPs, and piezometers	Early voluntary testing of a ROD-required contingency improved the conceptual site model (CSM) and provided a basis for full-scale expansion
December 2013 to November 2014	Full-Scale On-Site (OU1) Soils Remedy Construction, including expansion of ISVE1 system equipment and installation of five DPE wells (DPE-3,-4, -5, -8, and -9) and VEWs (VE-31S, VE-32S, VE-33S, VE-34S, VE-35S, VE-36S, VE-37S, VE-38S, VE-39S, VE-40S, VE-6D, VE-7D, VE-10D, VE-11D, VE-12D, VE-13D and VE-14D)	Significant expansion of the ISVE1 system into the OU1 SVE system. Lateral expansion with additional shallow SVE wells and vertical expansion with deep vadose zone SVE wells and DPE wells.
January 2015	Additional conveyance added to VE-2D, VE-8S and VE-9S for optimized extraction	Increased flow rates for source area wells, and resulting improvements in mass removal rates from these source area wells
December 2016	Installed new VMPs along Whittier Boulveard (VMP-107, -108, -109, -110)	Defined upgradient extent of Omega-related VOCs in soil gas in the vadose zone
April 2017	Conversion of VE-7D and VE-10D VEWs into OU1 DPE wells	
May 2017	Begin continuous operation of VE-7D and VE-10D	Improved drawdown of site groundwater and improved VOC recovery from the deep vadose zone
September 2018	Improvements to PLC (sun protection and addition of electrical panel ventilation fans)	Improved system operability and reliability
October 2018 - January 2019	Began cycled operations of existing OU1 SVE wells with poor mass recovery (VE-14S, VE-15S, and VE-31S). Also converted some unused VMPs to passive air inlet wells to evaluate potential for changing subsurface flow paths and increasing mass recovery.	Cycling resulted in improved distribution of SVE system capacity to better-performing VEWs and DPE wells. Use of multiple VMPs as passive air inlet wells did not improve recovery measurably from nearby VEWs or DPE wells.
February to May 2019	Replacement of GAC vessels	Improved system operability and reliability
July 2019	Installation of permanent piping between the OU1 SVE and GWCS for vapor condensate transfer and treatment	Improved condensate treatment operability and reliability
July 2021	Improvements to the OU1 data transfer and storage (e.g. addition of remote log-in and replacement of radios)	Improved data management
September 2021	Installation of additional vapor monitoring wells: VE-45D, VMP-117, VE-47S, VE-48S/D, VMP-118, VE-49S/D, VE-49S/D, VE-50S/D)	Improved understanding of CSM and system performance to date

Notes:
1. In addition to the larger optimization activities listed above, on a quarterly basis flow and VOC concentration data were used to adjust manifold valves to maximize mass removal.

Abbreviations:
CSM - conceptual site model
DPE - dual-phase extraction
GWTS - Groundwater Containment System
ISVE - interim soil vapor extraction
SVE - soil vapor extraction
VEW - vapor extraction well
VMP - vapor monitoring probe

Information compiled by CDM Smith, 2022

Table 3: Comparison of Recent Soil Gas Concentrations and Record of Decision Soil Gas Cleanup Levels

Chemical	Maximum Pre-Remediation Soil Gas Concentration (ug/m3)[1]	ROD Soil Gas Cleanup Level (ug/m3)	Operable Unit 1 Data Collection Program (August 2021 to February 2022)			
			Number of Sample Locations[2]	Minimum Soil Gas[3] (ug/m3)	Maximum Soil Gas[3,4] (ug/m3)	Number of Sample Locations Exceeding ROD Soil Gas Cleanup Level[2]
1,2-Dichloroethane	10,000	83	35	<3.4	<86	0
1,1-Dichloroethene	1,600,000	110,000	35	<3.3	110	0
cis-1,2-Dichloroethene	38,000	22,000	0[5]			0[6]
trans-1,2-Dichloroethene	25,000	45,000	0[5]			0[6]
Tetrachloroethene (PCE)	3,400,000	470	35	<7.1	26,000	6
1,1,1-Trichloroethane (TCA)	2,500,000	1,300,000	35	<4.6	610	0
Trichloroethene (TCE)	450,000	1,300	35	<5.2	200	0
Freon 11	920,000	390,000	35	<5.6	160	0

Notes:

1. Soil gas samples collected from shallow soil (upper 30 feet) after January 1, 2000
2. If there was more than one depth interval sampled within the shallow soil (upper 30 feet) at a given location, the sample location, not the sample depths, are included in number of sample locations.
3. Soil gas samples collected from shallow soil (upper 30 feet) during Operable Unit 1 data collection program
4. Maximum recent soil gas concentrations for non-detect values do not include samples with elevated detection limits due to the detection of tetrachloroethene at concentrations exceeding ROD soil gas cleanup level.
5. Cis- and trans-1,2-dichloroethene (cis- and trans-1,2-DCE) have not been routinely monitored in OU1; however, neither of these compounds were detected in any shallow soil gas samples collected in 2020 or 2021. The most recent detections for cis-1,2-DCE in a vapor extraction well and vapor monitoring probe were 7.8 ug/m3 in August 2019 and 70 ug/m3 in June 2019, respectively. The most recent detections of trans-1,2-DCE in a vapor extraction well and vapor monitoring probe were 4.4 ug/m3 in June 2014 and 2.4 ug/m3 in December 2011, respectively.
6. Based on results of soil gas samples collected during operation of OU1 system (see note 5).

ug/m3	micrograms per cubic meter
ROD	Operable Unit 1 Soil Record of Decision, EPA 2008
<	Non-detect, the value presented is the reporting limit

Table 4: Comparison of Recent Soil Matrix Concentrations and Record of Decision Direct Contact to Soil Cleanup Levels

Chemical	Maximum Pre-Remediation Soil Concentration (ug/kg)	ROD Soil Matrix Cleanup Level (ug/kg)	Operable Unit 1 Data Collection Program (August 2021 to February 2022)		
			Number of Soil Samples (Upper 30 Feet)	Minimum Soil Concentration (ug/kg)	Maximum Soil Concentration (ug/kg)
1,2-Dichloroethane	160	Not presented	33	<0.73	0.39
1,1-Dichloroethene	60,000	Not presented	33	<0.73	<1.5
cis-1,2-Dichloroethene	1.8	Not presented	33	<0.73	<1.5
trans-1,2-Dichloroethene	12	Not presented	33	<0.73	<1.5
Tetrachloroethene (PCE)	1,300,000	1,200	33	<0.76	47
1,1,1-Trichloroethane (TCA)	1,200,000	Not presented	33	<0.73	0.65
Trichloroethene (TCE)	140,000	Not presented	33	<1.5	<3.0
Freon 11	220,000	Not presented	33	<7.3	<15

ug/kg micrograms per kilogram
ROD Operable Unit 1 Soil Record of Decision, EPA 2008

Table 5: Summary of Pre-Removal Action and Recent Detected Main Contaminants in Groundwater Samples

Parameter	Pre-Removal Action[1]				Recent[2]			
	Number of Samples	Number of Detects	Maximum Detect (ug/m3)	Prevalence	Number of Samples	Number of Detects	Maximum Detect (ug/m3)	Prevalence
Tetrachloroethene (PCE)	196	196	170,000	100%	72	72	1,500	100%
Trichloroethene (TCE)	197	184	10,000	93%	72	61	150	85%
1,1-Dichloroethene	199	181	6,600	91%	72	59	62	82%
Freon 113	191	156	6,300	82%	72	64	1,300	89%
Freon 11	196	156	2,700	80%	72	62	35	86%
1,4-Dioxane	181	125	72,000	69%	72	60	280	83%

Notes:

1. Pre-Removal Action groundwater samples collected from 1996 to June 2009.

1. Recent groundwater samples collected after January 1, 2020

ug/l   micrograms per liter

Removal Action Memarandum, Main Contaminants

Table 6: Rebound Test Tetrachloroethene Results

Location ID	Depth	Baseline (July 2018-July 2021)[1]					Month 1	Month 2	Month 3				Month 6	Rebound Evaluation
		Number of Samples	Number of Detections	Minimum Result (µg/m3)	Maximum Result (µg/m3)	Geomean of PCE Results (µg/m^3)	Static Sample PCE Results (µg/m^3)	Static Sample PCE Results (µg/m^3)	Static Sample PCE Results (µg/m^3)	Dynamic Test PCE Results (µg/m^3)		Pneumatic Test	Static Sample	Maximum Variation from Baseline
										1-hour	8-hour			
DPE-3	Deep	4	4	2900	8300	4285	2400	3400		3200	3500		1300	No Change
DPE-4	Deep	3	3	260	380	313	2900	1700		1000	540	X	2000	Likely Increase
DPE-5	Deep	3	3	300	480	410	89	290					5600	Likely Increase
DPE-8	Deep	4	4	170	420	236	2400	2200		250	250	X	2000	Likely Increase
DPE-9	Deep	3	3	130	400	207	1900	3200		400	270		1700	Likely Increase
VE-1S	Shallow	4	4	83	170	107	72	87						No Change
VE-2D	Deep	4	3	37	5300	553	1000	1000		1200	1100	X	1200	No Change
VE-5S	Shallow	4	4	180	550	309	26	410		340	330		430	No Change
VE-6D	Deep	2	2	120	160	139	250	270					260	Likely Increase
VE-6S	Shallow	3	3	68	140	94	390	150					130	Likely Increase
VE-7D	Deep	2	2	450	2000	949	1500	1300					260	No Change
VE-8S	Shallow	4	4	640	2900	1153	810	810		960	1400	X	1200	No Change
VE-9S	Shallow	4	4	360	1000	751	1600	1700				X	1300[a]	Likely Increase
VE-10D	Deep	2	2	370	680	502	1500	1300		1200	1200		5200	Likely Increase
VE-10S	Shallow	4	3	8.3	380	130	300	280		250	440	X	560	Likely Increase
VE-11S	Shallow	4	2	8.1	690	63	40	45						No Change
VE-12S	Shallow	2	2	28	110	56	74	100					150	Likely Increase
VE-14D	Deep	3	3	74	380	212	200						280	No Change
VE-14S	Shallow	4	3	7.8	94	28	320	140					18	Likely Increase
VE-15S	Shallow	5	4	9	370	61	88	84					110	No Change
VE-21S	Shallow	2	2	14	49	26	7.1	36					74	Likely Increase
VE-31S	Shallow	3	2	8.8	99	31	17	51						No Change
VE-34S	Shallow	2	2	43	61	51	7.6	77					120	Likely Increase
VE-39S	Shallow	1	1	38	38	38	12	30						Likely Decrease
VMP-11-30	Shallow	5	5	44	1500	502		800					1000	No Change
VMP-12-30	Shallow	5	4	8.4	74	32		62						No Change
VMP-15-30	Shallow	5	4	8.6	51	28		50						No Change
VMP-16-30	Shallow	5	4	7.8	240	40		110					100	No Change
VMP-17-30	Shallow	5	4	8.7	120	39		21						No Change

Table 6: Rebound Test Tetrachloroethene Results

		Baseline (July 2018-July 2021)[1]					Month 1	Month 2	Month 3				Month 6	Rebound Evaluation
		Number of Samples	Number of Detections	Minimum Result (µg/m3)	Maximum Result (µg/m3)	Geomean of PCE Results (µg/m^3)	Static Sample PCE Results (µg/m^3)	Static Sample PCE Results (µg/m^3)	Static Sample PCE Results (µg/m^3)	Dynamic Test PCE Results (µg/m^3)		Pneumatic Test	Static Sample	Maximum Variation from Baseline
Location ID	Depth									1-hour	8-hour			
VMP-18-30	Shallow	7	7	47	380	135		300					430	Likely Increase
VMP-20-30	Shallow	6	5	8.1	160	33		18						No Change
VMP-21-30	Shallow	8	8	41	350	124		93						No Change
VMP-22-30	Shallow	6	5	8.4	99	40		170					180	Likely Increase
VMP-23-30	Shallow	3	3	86	340	186		290					410	Likely Increase
VMP-24-30	Shallow	6	6	42	550	189		200					300	No Change
VMP-25-30	Shallow	3	3	74	140	97		72						Likely Decrease
VMP-26-30	Shallow	7	4	7.6	110	18		66					47	No Change
VMP-27-30	Shallow	4	3	7.9	130	18		7.4						Likely Decrease
VMP-31-24	Shallow	6	3	8.1	42	12		22						No Change
VMP-31-70	Deep	2	2	17000	74000	35468								Not Evaluated
VMP-32-12	Shallow	0	0	NA	NA			76						Not Evaluated
VMP-32-24	Shallow	6	6	16	130	30		52						No Change
VMP-32-60	Deep	7	7	9.7	600	37		33						No Change
VMP-43-24	Shallow	7	6	7.9	86	31		72					140	Likely Increase
VMP-93-60	Deep	6	6	200	4000	1932		970						No Change
VMP-94-24	Shallow	7	3	7.5	87	16		10						No Change
VMP-94-60	Deep	6	6	17	57	32		65					24	Likely Increase
VMP-95-60	Deep	6	6	31	200	105		160					190	No Change
VMP-117-6	shallow								6000					Not Evaluated
VMP-117-12	Shallow													Not Evaluated
VMP-117-24	Shallow													Not Evaluated
VMP-117-40	Deep								68					Not Evaluated
VMP-117-50	Deep								69					Not Evaluated
VMP-117-60	Deep													Not Evaluated
VMP-117-70	Deep													Not Evaluated
VMP-117-80	Deep													Not Evaluated
VMP-118-6	Shallow								590					Not Evaluated
VMP-118-12	Shallow								1500					Not Evaluated
VMP-118-24	Shallow								26000					Not Evaluated
VMP-118-40	Deep								2900					Not Evaluated
VMP-118-50	Deep								1600					Not Evaluated

Table 6: Rebound Test Tetrachloroethene Results

		Baseline (July 2018-July 2021)[1]					Month 1	Month 2	Month 3				Month 6	Rebound Evaluation
		Number of Samples	Number of Detections	Minimum Result (µg/m3)	Maximum Result (µg/m3)	Geomean of PCE Results (µg/m^3)	Static Sample PCE Results (µg/m^3)	Static Sample PCE Results (µg/m^3)	Static Sample PCE Results (µg/m^3)	Dynamic Test PCE Results (µg/m^3)		Pneumatic Test	Static Sample	Maximum Variation from Baseline
Location ID	Depth									1-hour	8-hour			
VMP-118-60	Deep								8900					Not Evaluated
VMP-118-70	Deep								940					Not Evaluated
VMP-118-80	Deep								1100					Not Evaluated

Notes:
1. Baseline time period includes samples from July 2018 to July 2021. Non-detects were handled as follows: If the non-detect was less than the minimum detected result at the location, then the value was retained; if the non-detect was greater than the minimum detected result at the location, then the value was discarded.

[a] Result from resample of VE-9S in February 2022

µg/m^3 = micrograms per cubic meter
PCE = Tetrachloroethene
NA = Not applicable, data not available
yellow cells indicate the maximum rebound sample

Rebound characterized as follows:

Likely Increase	Result > Max Baseline
No Change	Max Baseline >= Result >= Min Baseline
Likely Decrease	Result < Min Baseline

Table 7a: Summary of Pre-Remediation and Current Volatile Organic Compounds Detected in Soil Matrix Samples

	Pre-Remediation				Current			
Parameter	**Number of Samples**	**Number of Detects**	**Maximum Detect (ug/kg)**	**Prevalence**	**Number of Samples**	**Number of Detects**	**Maximum Detect (ug/kg)**	**Prevalence**
Tetrachloroethene (PCE)	142	139	1,300,000	98%	103	82	47	80%
Trichloroethene (TCE)	142	68	140,000	48%	103	3	0.64	3%
1,1,1-Trichloroethane (TCA)	142	55	1,200,000	39%	103	4	0.65	4%
1,1-Dichloroethene	142	52	60,000	37%	103	0		0%
Chloroform	142	52	3,000	37%	103	0		0%
1,2-Dichloroethane	142	37	5,000	26%	103	7	0.64	7%
1,1-Dichloroethane	142	35	26	25%	103	0		0%
Freon 113	142	22	590,000	15%	103	3	3.9	3%
1,1,2-Trichloroethane	142	21	140	15%	103	0		0%
Freon 11	142	19	220,000	13%	103	1	1.6	1%
trans-1,2-Dichloroethene	142	17	60	12%	103	0		0%
Benzene	142	15	7.8	11%	103	85	5.5	83%
Methylene chloride	142	14	100,000	10%	103	19	46	18%
cis-1,2-Dichloroethene	142	12	21	8%	103	0		0%
Toluene	142	5	62,000	4%	103	27	2.1	26%
1,1,1,2-Tetrachloroethane	81	3	5	4%	103	0		0%
Acetone	142	3	950	2%	103	56	35	54%
1,2-Dichlorobenzene	159	2	0.93	1%	103	0		0%
Bromoform	142	2	25	1%	103	16	250	16%
trans-1,3-Dichloropropene	142	1	24	1%	103	0		0%
1,4-Dichlorobenzene	159	1	1.6	1%	103	0		0%
Vinyl acetate	91	1	50	1%	103	0		0%
m,p-Xylene	81			0%	103	8	0.93	8%
Carbon disulfide	91			0%	103	4	0.65	4%
Ethylbenzene	142			0%	103	6	0.38	6%
Dibromochloromethane	142			0%	103	7	2.6	7%
Methyl ethyl ketone	111			0%	103	9	7.4	9%
Bromobenzene	81			0%	103	2	0.4	2%
Methyl isobutyl ketone	111			0%	103	1	2.8	1%
Bromodichloromethane	142			0%	103	3	0.44	3%

The soil samples were collected from all depths within Operable Unit 1

ug/kg   micrograms per kilogram

Record of Decision primary contaminant of concern

Table 7b: Summary of Pre-Remediation and Current Volatile Organic Compounds Detected in Soil Gas Samples

Parameter	Pre-Remediation				Current			
	Number of Samples	Number of Detects	Maximum Detect (ug/m3)	Prevalence	Number of Samples	Number of Detects	Maximum Detect (ug/m3)	Prevalence
1,1-Dichloroethene	156	156	3,400,000	100%	134	81	2,000	60%
Freon 11	156	155	920,000	99%	134	112	2,000	84%
Freon 113	156	155	4,300,000	99%	134	125	87,000	93%
Tetrachloroethene (PCE)	156	155	6,100,000	99%	134	130	26,000	97%
Trichloroethene (TCE)	156	154	610,000	99%	134	96	570	72%
Chloroform	156	113	180,000	72%	134	35	88	26%
1,1-Dichloroethane	156	105	110,000	67%	134	2	5.7	1%
1,1,1-Trichloroethane (TCA)	156	103	2,500,000	66%	134	40	1,200	30%
Acetone	156	92	38,000	59%				
trans-1,2-Dichloroethene	156	85	79,000	54%				
Carbon disulfide	156	77	44,000	49%	134	9	180	7%
Toluene	156	61	12,000	39%	134	15	1,200	11%
Benzene	156	49	8,000	31%	134	13	460	10%
cis-1,2-Dichloroethene	156	48	38,000	31%				
1,2-Dichloroethane	156	39	140,000	25%	134	2	13	1%
Methylene chloride	156	34	62,000	22%	134	17	690	13%
Freon 12	156	24	13,000	15%	134	0		0%
Isopropyl Alcohol (Isopropanol)	69	8	37,000	12%	134	79	440	59%
Hexane (N-Hexane)	69	7	37,000	10%	134	6	3,200	4%
1,1,2-Trichloroethane	156	9	1,400	6%	134	0		0%
o-Xylene	156	9	3,500	6%	134	10	2,400	7%
m,p-Xylene	156	8	700	5%				
Carbon tetrachloride	156	6	330	4%	134	0		0%
Methyl ethyl ketone	156	5	250	3%	134	54	4,500	40%
Vinyl chloride	156	5	360	3%	134	0		0%
1,2,4-Trimethylbenzene	156	3	16	2%				
Chloromethane	156	2	1.8	1%				
Ethylbenzene	156	2	18	1%				
1,3,5-Trimethylbenzene	156	1	130	1%				
2-Hexanone	156	1	2,700	1%				
1,4-Dioxane	69			0%	134	2	160	1%

The soil gas samples collected were collected from all depths within Operable Unit 1

ug/m3 micrograms per cubic meter

Record of Decision primary contaminant of concern

Table 8a. Comparison of Primary Contaminants of Concern in Soil Matrix Samples within Different Depth Intervals

Shallow Soil (Upper 30 feet)	Pre-Remediation			Current			Percent Reduction[1]
	Samples	Detects	Max (ug/kg)	Samples	Detects	Max (ug/kg)	
1,1,1-Trichloroethane (TCA)	57	19	1,200,000	33	2	0.65	>99.9%
1,1-Dichloroethene	57	14	60,000	33	0	ND	>99.9%
1,2-Dichloroethane	57	6	160	33	1	0.39	99.8%
cis-1,2-Dichloroethene	57	2	1.8	33	0	ND	NC
Freon 11	57	6	220,000	33	0	ND	>99.9%
Tetrachloroethene (PCE)	57	56	1,300,000	33	26	47	>99.9%
trans-1,2-Dichloroethene	57	2	12	33	0	ND	91.7%
Trichloroethene (TCE)	57	18	140,000	33	0	ND	>99.9%

Deep Soil (>30 to 70 feet)	Pre-Remediation			Current			Percent Reduction[1]
	Samples	Detects	Max (ug/kg)	Samples	Detects	Max (ug/kg)	
1,1,1-Trichloroethane (TCA)	66	30	1,500	44	2	0.39	>99.9%
1,1-Dichloroethene	66	33	450	44	0	ND	99.8%
1,2-Dichloroethane	66	26	2,100	44	5	0.64	>99.9%
cis-1,2-Dichloroethene	66	10	21	44	0	ND	95.2%
Freon 11	66	11	38	44	0	ND	97.4%
Tetrachloroethene (PCE)	66	65	56,000	44	38	18	>99.9%
trans-1,2-Dichloroethene	66	15	60	44	0	ND	98.3%
Trichloroethene (TCE)	66	42	520	44	1	0.35	>99.9%

Formerly Saturated Soil (>70 to 85 feet)	Pre-Remediation			Current			Percent Reduction[1]
	Samples	Detects	Max (ug/kg)	Samples	Detects	Max (ug/kg)	
1,1,1-Trichloroethane (TCA)	14	5	3,100	18	0	ND	>99.9%
1,1-Dichloroethene	14	5	1,300	18	0	ND	>99.9%
1,2-Dichloroethane	14	3	5,000	18	1	0.4	>99.9%
cis-1,2-Dichloroethene	14	0	ND	18	0	ND	NC
Freon 11	14	2	37	18	0	ND	97.3%
Tetrachloroethene (PCE)	14	14	16,000	18	11	2.8	>99.9%
trans-1,2-Dichloroethene	14	0	ND	18	0	ND	NC
Trichloroethene (TCE)	14	7	4,200	18	0	ND	>99.9%

[1] If current samples were non-detect, the current sample was assumed to be equal to 1 ug/kg. Did not calculate percent reduction if the initial concentration was less than 10 ug/kg.

ug/kg micrograms per kilogram
ND Not detected
NC Not calculated

Table 8b. Comparison of Primary Contaminants of Concern in Soil Gas Samples within Shallow and Deep Soil

Shallow Soil Gas (Upper 30 feet)	Pre-Remediation			During Rebound			Percent Reduction
	Samples	Detects	Max (ug/m3)	Samples	Detects	Max (ug/m3)	
1,1,1-Trichloroethane (TCA)	100	60	2,500,000	78	16	610	>99.9%
1,1-Dichloroethene	100	100	1,600,000	78	30	110	>99.9%
1,2-Dichloroethane	100	24	10,000	78	0	ND	>99.9%
cis-1,2-Dichloroethene	100	36	38,000	NA			NC
Freon 11	100	100	920,000	78	60	160	>99.9%
Tetrachloroethene (PCE)	100	100	3,400,000	78	75	26,000	99.2%
trans-1,2-Dichloroethene	100	49	25,000	NA			NC
Trichloroethene (TCE)	100	100	450,000	78	47	200	>99.9%

Deep Soil Gas (>30 feet)	Pre-Remediation			During Rebound			Percent Reduction[1]
	Samples	Detects	Max (ug/m3)	Samples	Detects	Max (ug/m3)	
1,1,1-Trichloroethane (TCA)	56	43	1,600,000	56	24	1,200	>99.9%
1,1-Dichloroethene	56	56	3,400,000	56	51	2,000	>99.9%
1,2-Dichloroethane	56	15	140,000	56	2	13	>99.9%
cis-1,2-Dichloroethene	56	12	6,000	NA			NC
Freon 11	56	55	840,000	56	52	2,000	99.8%
Tetrachloroethene (PCE)	56	55	6,100,000	56	55	8,900	99.9%
trans-1,2-Dichloroethene	56	36	79,000	NA			NC
Trichloroethene (TCE)	56	54	610,000	56	49	570	>99.9%

ug/m3 micrograms per cubic meter
ND Not detected
NC Not calculated
NA Not analyzed

Table 9. Proximal Pre-Remediation Soil Samples to Operable Unit 1 Data Collection Soil Samples

Pair	OU1DC Location	OU1DC Sample Depth (feet)	Parameter	OU1DC Is Detect	OU1DC_Result (ug/kg)	Pre-Remediation Location	Pre-Remediation Depth (Feet)	Pre-Remediation Result (ug/kg)
1	SB-2101	5	1,1,1-Trichloroethane (TCA)	NO	1	B-4	5	15,000
1	SB-2101	5	Tetrachloroethene (PCE)	NO	1	B-4	10	1,900
1						B-4	5	510,000
2	SB-2101	15	1,1,1-Trichloroethane (TCA)	NO	1.1	B-4	15	1,200
2	SB-2101	15	Tetrachloroethene (PCE)	NO	1.1	B-4	15	9,800
3	SB-2101	25	1,1,1-Trichloroethane (TCA)	NO	1.3	B-4	20	1,100
3	SB-2101	25	Tetrachloroethene (PCE)	NO	1.3	B-4	20	11,000
4	SB-2101	35	1,1,1-Trichloroethane (TCA)	NO	0.91	B-4	30	850
4	SB-2101	35	Tetrachloroethene (PCE)	YES	0.35	B-4	30	5,200
5	SB-2101	45	Tetrachloroethene (PCE)	YES	0.63	B-4	45	8,400
6	SB-2101	60	Tetrachloroethene (PCE)	NO	1.1	B-4	55	56,000
7	SB-2101	65	1,1,1-Trichloroethane (TCA)	NO	0.99	B-4	65	1,500
7						B-4	70	670
7	SB-2101	65	Tetrachloroethene (PCE)	NO	0.99	B-4	65	27,000
7						B-4	70	11,000
8	SB-2101	75	1,1,1-Trichloroethane (TCA)	NO	0.74	B-4	75	960
8	SB-2101	75	1,1-Dichloroethene	NO	0.74	B-4	75	990
8	SB-2101	75	Freon 113	NO	7.4	B-4	75	980
8	SB-2101	75	Tetrachloroethene (PCE)	NO	0.74	B-4	75	16,000
8	SB-2101	75	Trichloroethene (TCE)	NO	1.5	B-4	75	540
9	SB-2102	50	1,1-Dichloroethene	NO	0.84	OW2	45	6
9	SB-2102	50	Tetrachloroethene (PCE)	YES	0.91	OW2	45	47
9	SB-2102	50	Trichloroethene (TCE)	NO	1.7	OW2	45	4.2
10	SB-2102	60	1,1,1-Trichloroethane (TCA)	NO	0.92	OW2	60	3.2
10	SB-2102	60	1,1-Dichloroethene	NO	0.92	OW2	60	21
10	SB-2102	60	Tetrachloroethene (PCE)	NO	0.92	OW2	60	92
10	SB-2102	60	Trichloroethene (TCE)	NO	1.8	OW2	60	7.2
11	SB-2102	80	Freon 113	NO	7.6	OW2	80	16
11	SB-2102	80	Tetrachloroethene (PCE)	NO	0.76	OW2	80	4.8
12	SB-2103	45	1,1-Dichloroethene	NO	1	GP7	45	10
12	SB-2103	45	1,2-Dichloroethane	NO	1	GP7	45	2.2

Table 9. Proximal Pre-Remediation Soil Samples to Operable Unit 1 Data Collection Soil Samples

Pair	OU1DC Location	OU1DC Sample Depth (feet)	Parameter	OU1DC Is Detect	OU1DC_Result (ug/kg)	Pre-Remediation Location	Pre-Remediation Depth (Feet)	Pre-Remediation Result (ug/kg)
12	SB-2103	45	Tetrachloroethene (PCE)	YES	1.1	GP7	45	230
12	SB-2103	45	Trichloroethene (TCE)	NO	2	GP7	45	16
13	SB-2103	55	1,1,1-Trichloroethane (TCA)	NO	1	GP7	60	6.6
13	SB-2103	55	1,1-Dichloroethene	NO	1	GP7	60	85
13	SB-2103	55	1,2-Dichloroethane	NO	1	GP7	60	2
13	SB-2103	55	cis-1,2-Dichloroethene	NO	1	GP7	60	2.4
13	SB-2103	55	Tetrachloroethene (PCE)	YES	0.48	GP7	60	6,200
13	SB-2103	55	trans-1,2-Dichloroethene	NO	1	GP7	60	4.9
13	SB-2103	55	Trichloroethene (TCE)	NO	2.1	GP7	60	110
14	SB-2103	65	1,1,1-Trichloroethane (TCA)	NO	1	GP7	65	10
14	SB-2103	65	1,1-Dichloroethene	NO	1	GP7	65	110
14	SB-2103	65	1,2-Dichloroethane	NO	1	GP7	65	5
14	SB-2103	65	cis-1,2-Dichloroethene	NO	1	GP7	65	2.1
14	SB-2103	65	Freon 11	NO	10	GP7	65	5.7
14	SB-2103	65	Tetrachloroethene (PCE)	NO	1	GP7	65	11,000
14	SB-2103	65	trans-1,2-Dichloroethene	NO	1	GP7	65	7.1
14	SB-2103	65	Trichloroethene (TCE)	NO	2.1	GP7	65	130
15	SB-2107	25	1,1,1-Trichloroethane (TCA)	NO	0.79	GP4-MIP	20	2.6
15	SB-2107	25	1,2-Dichloroethane	NO	0.79	GP4-MIP	20	3.2
15	SB-2107	25	Tetrachloroethene (PCE)	YES	0.67	GP4-MIP	20	100
15	SB-2107	25	Trichloroethene (TCE)	NO	1.6	GP4-MIP	20	7.1
16	SB-2107	35	1,1,1-Trichloroethane (TCA)	NO	0.91	GP4-MIP	35	5.1
16	SB-2107	35	1,1-Dichloroethene	NO	0.91	GP4-MIP	35	13
16	SB-2107	35	1,2-Dichloroethane	NO	0.91	GP4-MIP	35	14
16	SB-2107	35	Tetrachloroethene (PCE)	YES	2.2	GP4-MIP	35	4,200
16	SB-2107	35	Trichloroethene (TCE)	NO	1.8	GP4-MIP	35	30
17	SB-2107	45	1,1,1-Trichloroethane (TCA)	NO	0.87	GP4-MIP	48	15
17	SB-2107	45	1,1-Dichloroethene	NO	0.87	GP4-MIP	48	36
17	SB-2107	45	1,2-Dichloroethane	NO	0.87	GP4-MIP	48	30

Table 9. Proximal Pre-Remediation Soil Samples to Operable Unit 1 Data Collection Soil Samples

Pair	OU1DC Location	OU1DC Sample Depth (feet)	Parameter	OU1DC Is Detect	OU1DC_Result (ug/kg)	Pre-Remediation Location	Pre-Remediation Depth (Feet)	Pre-Remediation Result (ug/kg)
17	SB-2107	45	Tetrachloroethene (PCE)	YES	2	GP4-MIP	48	4,300
17	SB-2107	45	Trichloroethene (TCE)	NO	1.7	GP4-MIP	48	74
18	SB-2107	62	1,1,1-Trichloroethane (TCA)	NO	0.92	GP4-MIP	68	340
18	SB-2107	62	Tetrachloroethene (PCE)	YES	4.3	GP4-MIP	68	48,000
18	SB-2107	62	Trichloroethene (TCE)	NO	1.8	GP4-MIP	68	430
19	SB-2108	5	1,1,1-Trichloroethane (TCA)	NO	1	SB-10	2.2	1,200
19						MIP3-B2	5	47
19						SB-10	6.5	740
19	SB-2108	5	1,1-Dichloroethene	NO	1	MIP3-B2	5	3.9
19	SB-2108	5	1,2-Dichloroethane	NO	1	MIP3-B2	5	6.3
19	SB-2108	5	Tetrachloroethene (PCE)	YES	0.99	SB-10	6.5	4,100
19						MIP3-B2	5	4,300
19						SB-10	2.2	6,600
19						SB-8	2.1	1,200
19						SB-8	6.6	790
19	SB-2108	5	Trichloroethene (TCE)	NO	2	MIP3-B2	5	28
20	SB-2108	15	1,1,1-Trichloroethane (TCA)	NO	0.86	C-2	15	600
20						MIP3-B2	15	64
20	SB-2108	15	1,1-Dichloroethene	NO	0.86	MIP3-B2	15	10
20	SB-2108	15	1,2-Dichloroethane	NO	0.86	C-1	15	150
20						MIP3-B2	15	16
20	SB-2108	15	Tetrachloroethene (PCE)	YES	6.9	MIP3-B2	15	2,400
20						GP3A	10	3,200
20						C-1	15	450
20						C-2	15	3,400
20	SB-2108	15	Trichloroethene (TCE)	NO	1.7	MIP3-B2	15	34
21	SB-2108	25	1,1,1-Trichloroethane (TCA)	NO	0.9	GP3A	20	16
21						MIP3-B2	30	28
21	SB-2108	25	1,1-Dichloroethene	NO	0.9	MIP3-B2	30	12
21	SB-2108	25	1,2-Dichloroethane	NO	0.9	GP3A	20	40
21						MIP3-B2	30	160

Table 9. Proximal Pre-Remediation Soil Samples to Operable Unit 1 Data Collection Soil Samples

Pair	OU1DC Location	OU1DC Sample Depth (feet)	Parameter	OU1DC Is Detect	OU1DC_Result (ug/kg)	Pre-Remediation Location	Pre-Remediation Depth (Feet)	Pre-Remediation Result (ug/kg)
21	SB-2108	25	Tetrachloroethene (PCE)	YES	47	MIP3-B2	30	3,600
21						GP3A	20	300
21						C-1	30	1,400
21						C-2	30	1,400
21	SB-2108	25	Trichloroethene (TCE)	NO	1.8	MIP3-B2	30	35
21						GP3A	20	9
22	SB-2108	35	1,1,1-Trichloroethane (TCA)	NO	0.9	MIP3-B2	33	39
22						GP3A	32	5.8
22	SB-2108	35	1,2-Dichloroethane	NO	0.9	GP3A	32	120
22						MIP3-B2	33	260
22	SB-2108	35	Tetrachloroethene (PCE)	YES	18	GP3A	32	130
22						MIP3-B2	33	1,700
22	SB-2108	35	Trichloroethene (TCE)	YES	0.35	MIP3-B2	33	43
22						GP3A	32	6.9
23	SB-2108	42	1,1,1-Trichloroethane (TCA)	NO	0.8	C-2	45	770
23						MIP3-B2	42	26
23	SB-2108	42	1,1-Dichloroethene	NO	0.8	MIP3-B2	42	35
23	SB-2108	42	1,2-Dichloroethane	NO	0.8	GP3A	45	220
23						MIP3-B2	42	220
23	SB-2108	42	Tetrachloroethene (PCE)	YES	8.3	C-2	45	6,900
23						C-1	45	2,400
23						MIP3-B2	42	2,700
23						GP3A	45	3,800
23	SB-2108	42	trans-1,2-Dichloroethene	NO	0.8	MIP3-B2	42	1.7
23	SB-2108	42	Trichloroethene (TCE)	NO	1.6	GP3A	45	140
23						MIP3-B2	42	74
24	SB-2108	50	1,1,1-Trichloroethane (TCA)	NO	0.92	MIP3-B2	57	30
24	SB-2108	50	1,1-Dichloroethene	NO	0.92	MIP3-B2	57	50
24	SB-2108	50	1,2-Dichloroethane	NO	0.92	MIP3-B2	57	74
24						GP3A	55	110

Table 9. Proximal Pre-Remediation Soil Samples to Operable Unit 1 Data Collection Soil Samples

Pair	OU1DC Location	OU1DC Sample Depth (feet)	Parameter	OU1DC Is Detect	OU1DC_Result (ug/kg)	Pre-Remediation Location	Pre-Remediation Depth (Feet)	Pre-Remediation Result (ug/kg)
24	SB-2108	50	Tetrachloroethene (PCE)	YES	2.5	MIP3-B2	57	6,900
24						C-2	52.5	8,100
24						GP3A	55	5,600
24	SB-2108	50	trans-1,2-Dichloroethene	NO	0.92	MIP3-B2	57	2.6
24	SB-2108	50	Trichloroethene (TCE)	NO	1.8	MIP3-B2	57	120
24						GP3A	55	130
25	SB-2108	61	1,1,1-Trichloroethane (TCA)	NO	0.81	MIP3-B2	66	54
25						GP3A	65	130
25	SB-2108	61	1,1-Dichloroethene	NO	0.81	MIP3-B2	66	56
25	SB-2108	61	1,2-Dichloroethane	NO	0.81	MIP3-B2	66	72
25						GP3A	65	140
25	SB-2108	61	Tetrachloroethene (PCE)	YES	2.9	GP3A	65	12,000
25						MIP3-B2	66	18,000
25	SB-2108	61	trans-1,2-Dichloroethene	NO	0.81	MIP3-B2	66	2.5
25	SB-2108	61	Trichloroethene (TCE)	NO	1.6	MIP3-B2	66	150
25						GP3A	65	190
26	SB-2108	75	1,2-Dichloroethane	NO	0.86	GP3A	78	2.1
26	SB-2108	75	Tetrachloroethene (PCE)	YES	1.2	GP3A	78	13
27	SB-2108	84	Tetrachloroethene (PCE)	YES	0.9	GP3A	85	970
28	SB-2109	10	Tetrachloroethene (PCE)	YES	13	SB-11	1.8	99,000
28						SB-11	6.5	260,000
29	SB-2110	10	1,1,1-Trichloroethane (TCA)	NO	0.85	SB-9	1.8	970,000
29						SB-9	5.9	1,200,000
29	SB-2110	10	1,1-Dichloroethene	NO	0.85	SB-9	1.8	60,000

Table 9. Proximal Pre-Remediation Soil Samples to Operable Unit 1 Data Collection Soil Samples

Pair	OU1DC Location	OU1DC Sample Depth (feet)	Parameter	OU1DC Is Detect	OU1DC_Result (ug/kg)	Pre-Remediation Location	Pre-Remediation Depth (Feet)	Pre-Remediation Result (ug/kg)
29	SB-2110	10	Freon 11	NO	8.5	SB-9	5.9	220,000
29						SB-9	1.8	160,000
29	SB-2110	10	Freon 113	NO	8.5	SB-9	1.8	420,000
29						SB-9	5.9	590,000
29	SB-2110	10	Tetrachloroethene (PCE)	YES	1.1	SB-9	5.9	1,100,000
29						SB-9	1.8	1,300,000
29	SB-2110	10	Trichloroethene (TCE)	NO	1.7	SB-9	1.8	98,000
29						SB-9	5.9	140,000

Table compiled for pre-remediation soil sample locations that had detectable concentration of respective compound. The pre-remediation soil boring was within 20 feet of the OU1 Data Collection Soil Boring.

ug/kg micrograms per kilogram
OU1DC Operable Unit 1 data collection program

Table 10. Tetrachloroethene Concentration Reduction in Area Proximal to Operable Unit 1 Soil Borings

OU1DC Location	OU1DC Sample Depth (feet)	OU1 DC Numerical Result (ug/kg)	OU1DC Is Detect	Average[1] Pre-Remediation Concentration (ug/kg)	Percent Reduction
SB-2101	5	<1	NO	255950	99.9998%
SB-2101	15	<1.1	NO	9800	99.9888%
SB-2101	25	<1.3	NO	11000	99.9882%
SB-2101	35	0.35	YES	5200	99.9933%
SB-2101	45	0.63	YES	8400	99.9925%
SB-2101	60	<1.1	NO	56000	99.9980%
SB-2101	65	<0.99	NO	19000	99.9974%
SB-2101	75	<0.74	NO	16000	99.9954%
SB-2102	50	0.91	YES	47	98.0638%
SB-2102	60	<0.92	NO	92	99.0000%
SB-2102	80	<0.76	NO	4.8	84.1667%
SB-2103	45	1.1	YES	230	99.5217%
SB-2103	55	0.48	YES	6200	99.9923%
SB-2103	65	<1	NO	11000	99.9909%
SB-2107	25	0.67	YES	100	99.3300%
SB-2107	35	2.2	YES	4200	99.9476%
SB-2107	45	2	YES	4300	99.9535%
SB-2107	62	4.3	YES	48000	99.9910%
SB-2108	5	0.99	YES	3398	99.9942%
SB-2108	15	6.9	YES	2362.5	99.9270%
SB-2108	25	47	YES	1675	99.2985%
SB-2108	35	18	YES	915	99.0164%
SB-2108	42	8.3	YES	3950	99.9475%
SB-2108	50	2.5	YES	6866.666667	99.9879%
SB-2108	61	2.9	YES	15000	99.9903%
SB-2108	75	1.2	YES	13	90.7692%
SB-2108	84	0.9	YES	970	99.9072%
SB-2109	10	13	YES	179500	99.9964%
SB-2110	10	1.1	YES	1200000	100.0000%

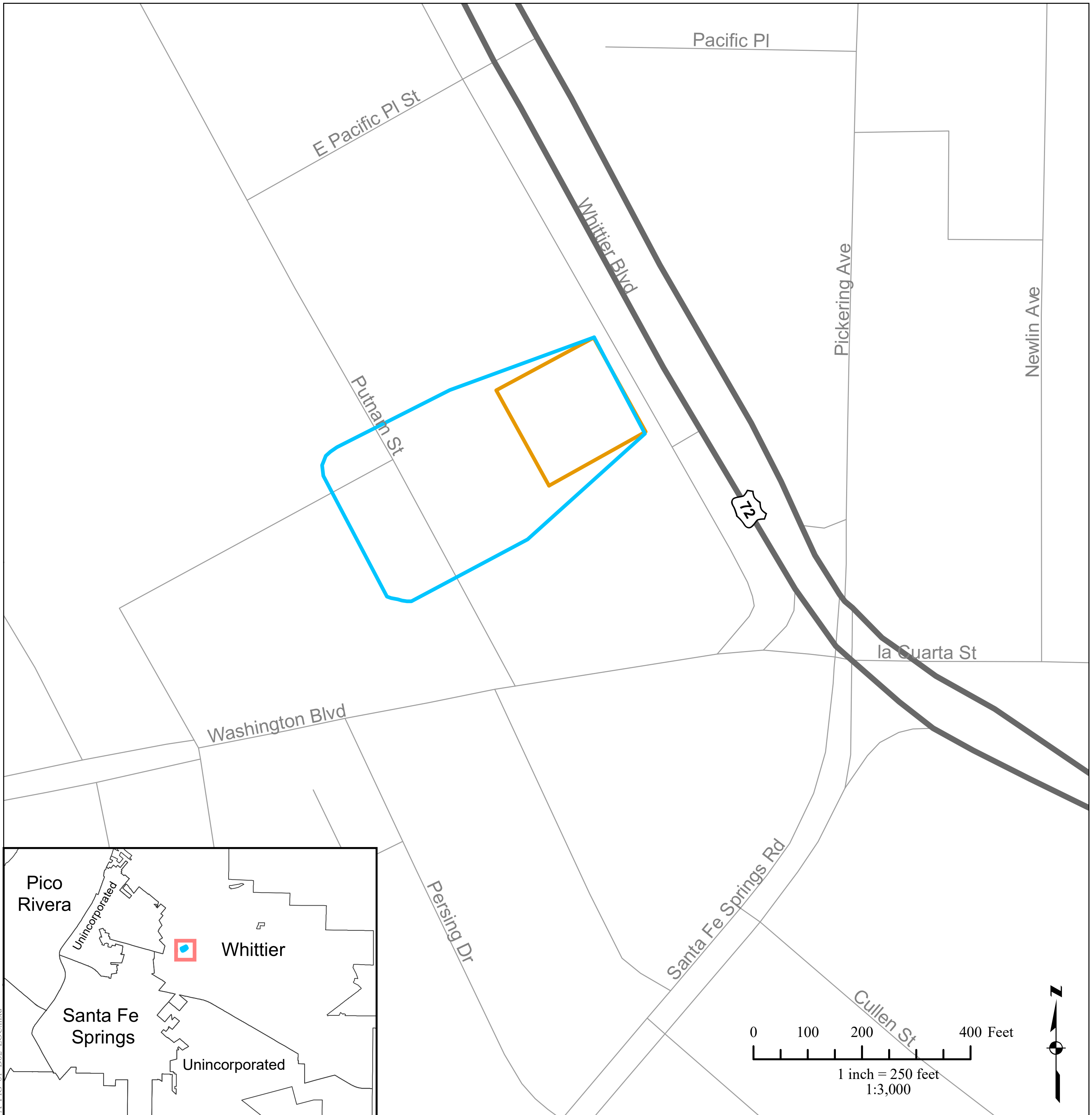
[1] Percent reduction is calculated based on the average of detected value for pre-remediation soil borings with sample depths in similar intervals. See Table 9 for Operable Unit 1 Data Collection and pre-remediation soil boring pairs.

Min All	84.2%
Max All	>99.9%
Average All	98.9%

Min Detects	90.8%
Max Detects	>99.9%
Average Detects	99.3%

OU1DC Operable Unit 1 data collection program

FIGURES



EXPLANATION

OU1 BOUNDARY

FORMER OMEGA CHEMCIAL PROPERTY

FIGURE 1
LOCATION MAP

DATA COLLECTION PROGRAM
OPERABLE UNIT 1

Engineering Analytics, Inc.

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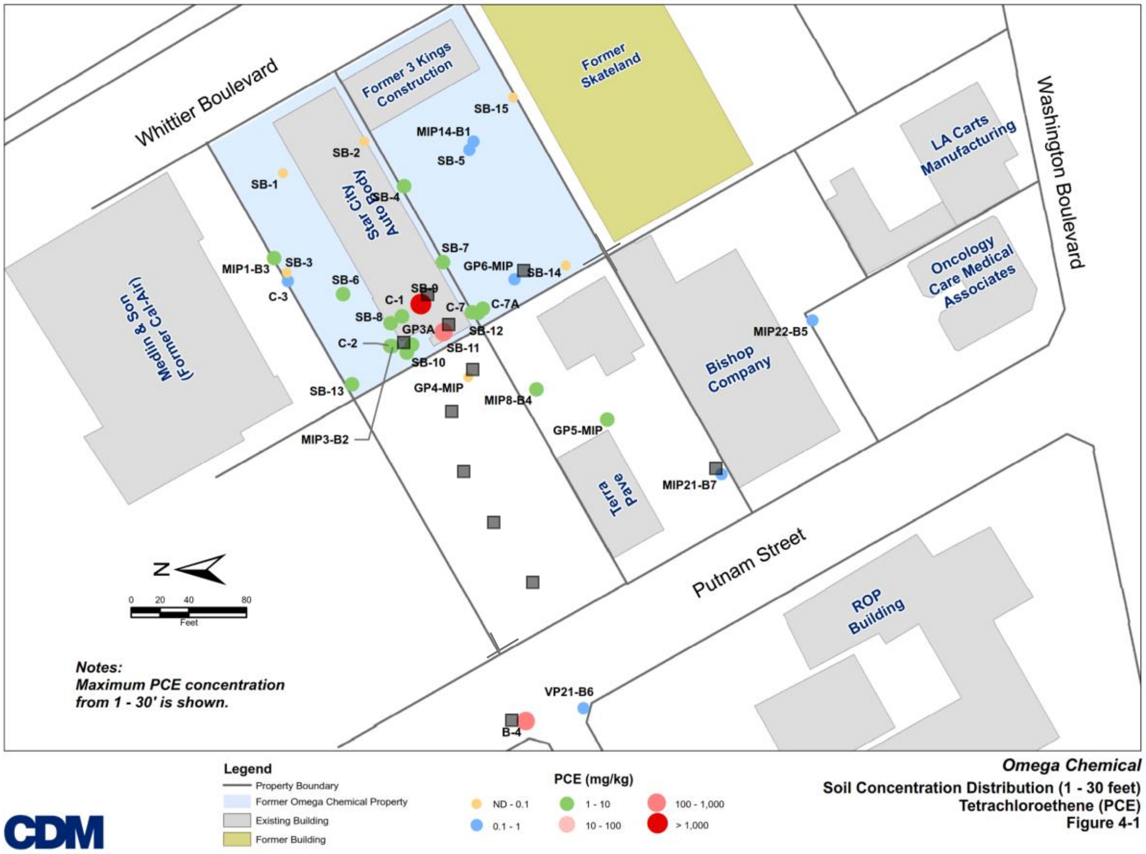
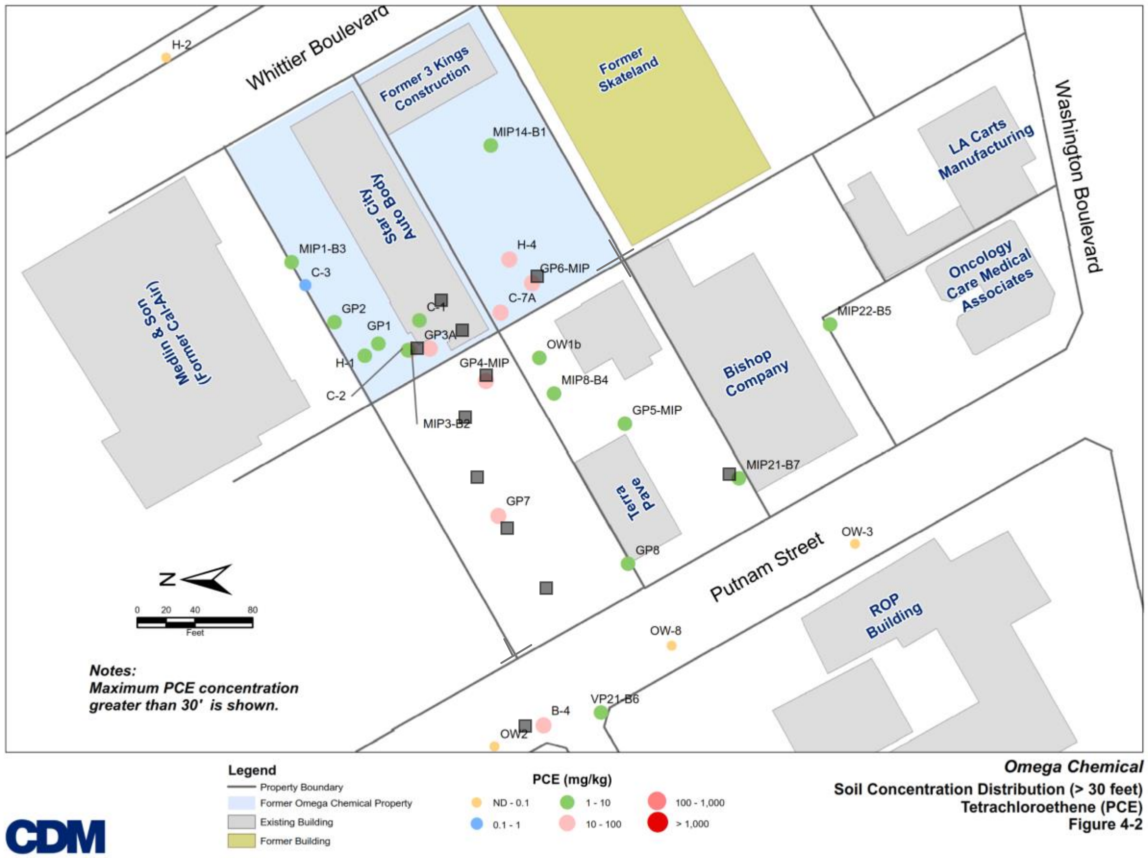
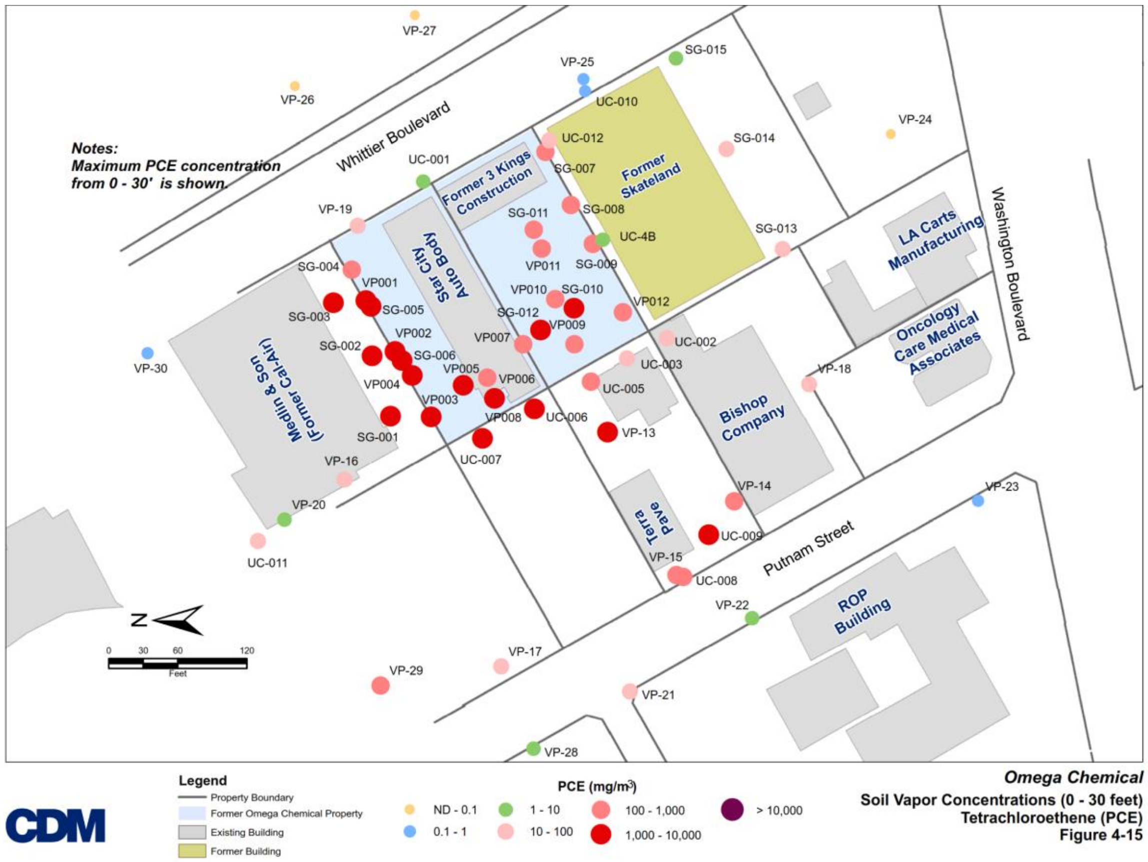


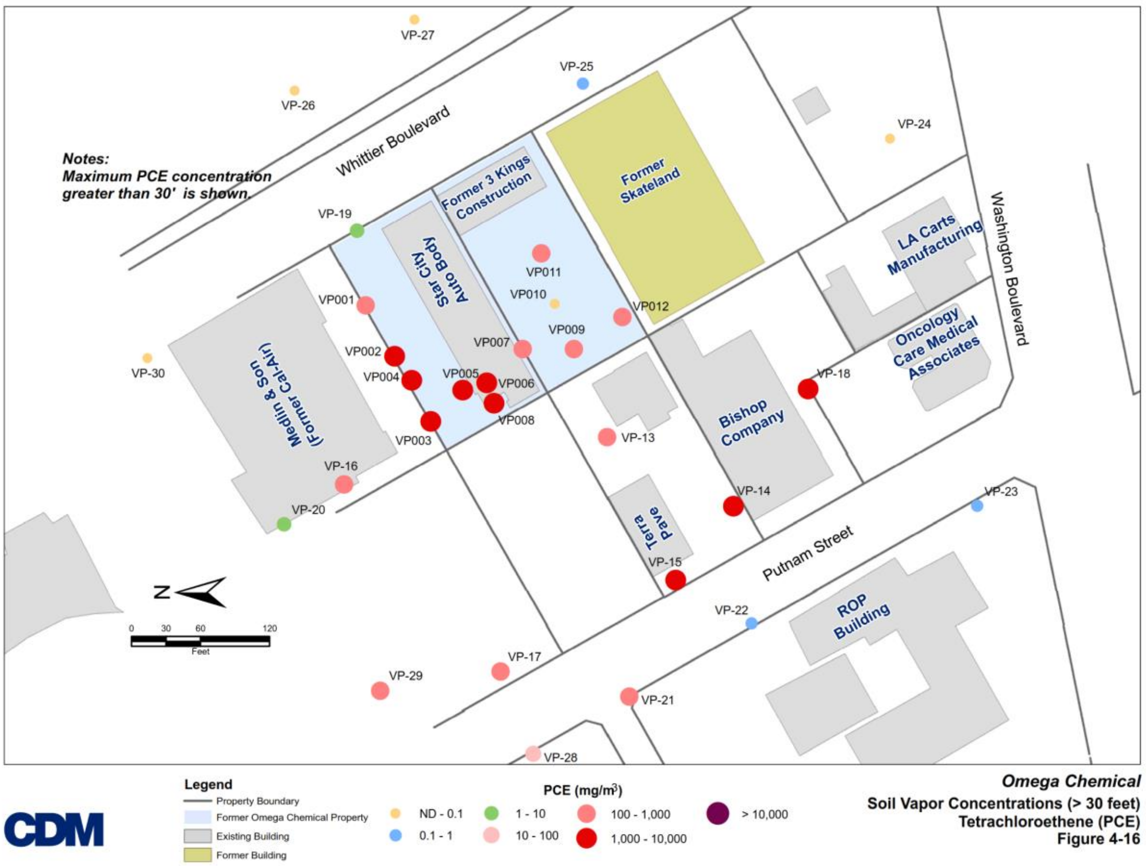


Source: CDM 2007. Remedial Investigation Report

Note: Added approximate location of 2021 OU1 data collection program soil boring (■)

Figure 2. Tetrachloroethene in Soil Matrix, Pre-Remediation





Source: CDM 2007. Remedial Investigation Report

Note: The 2021 OU1 data collection program included soil gas sampling across OU1 (not illustrated)

Figure 3. Tetrachloroethene in Soil Gas, Pre-Remediation

Source: de maximis Full Scale On-Site Soil Remedy Performance Evaluation Report, Third Quarter 2021 (November 15, 2021)

- Shallow Vapor Extraction Well (<30ft bgs)
- Deep Vapor Extraction Well (>30ft bgs)
- Dual Phase Extraction Well
- Building Currently Commercially/Industrially Occupied
- Building Currently Vacant
- Vapor Monitoring Probe
- OU-1 SVE Treatment Plant
- OU-1 Boundary
- Former Omega Chemical Property Boundary
- Conveyance Piping

Not all conveyance piping shown. Locations are approximate.

ddms
de maximis, inc.

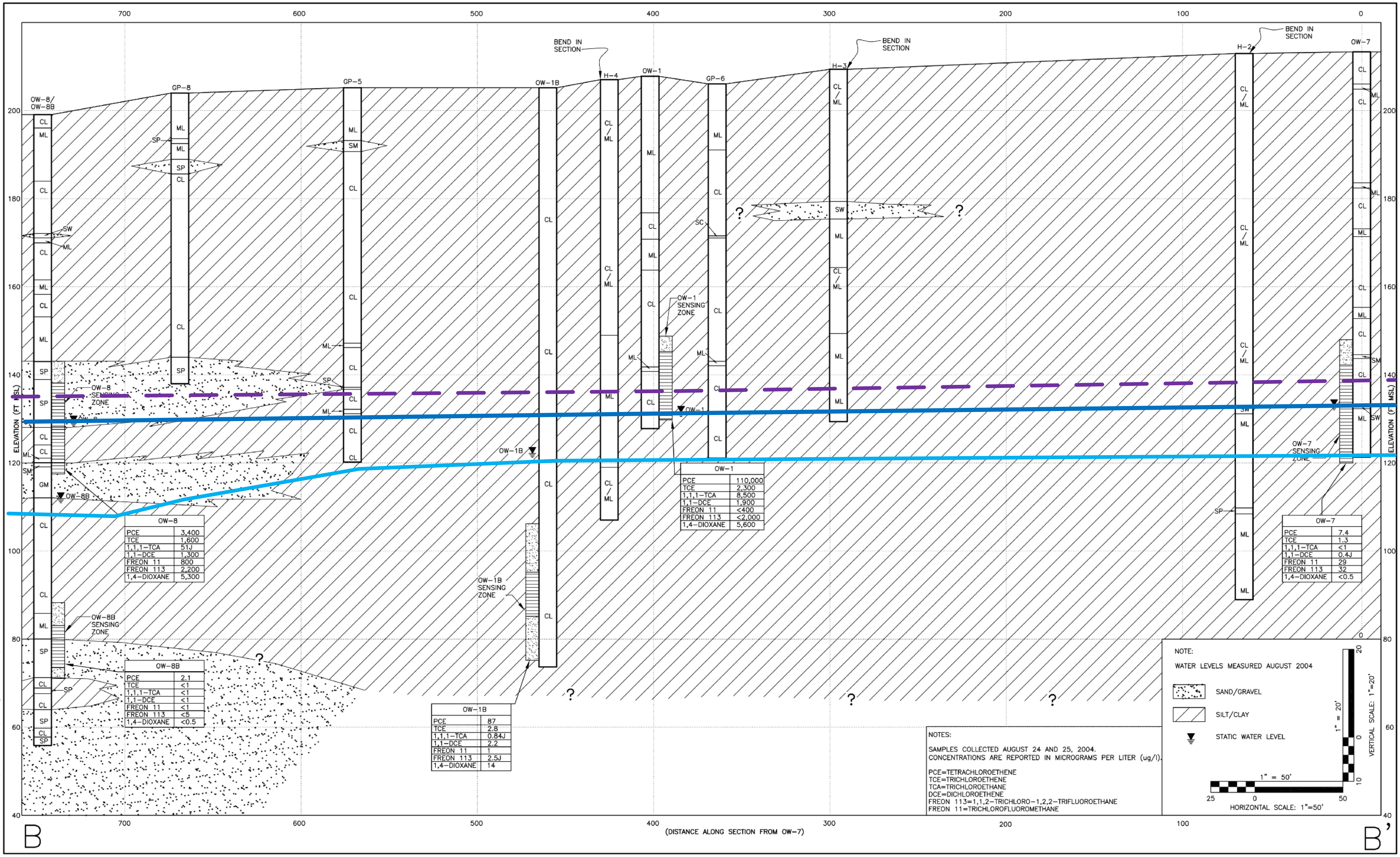
Reviewed By: LM
Drawn By: KM
Date: 2/12/2019

Figure 4
OU-1 SVE System Location Map
OU-1 Full Scale On-Site Soil Remedy,
Omega Chemical Superfund Site

CDM

Source: CDM 2005. Engineering Evaluation and Cost Analysis.

Figure 5a. Cross-Section Location



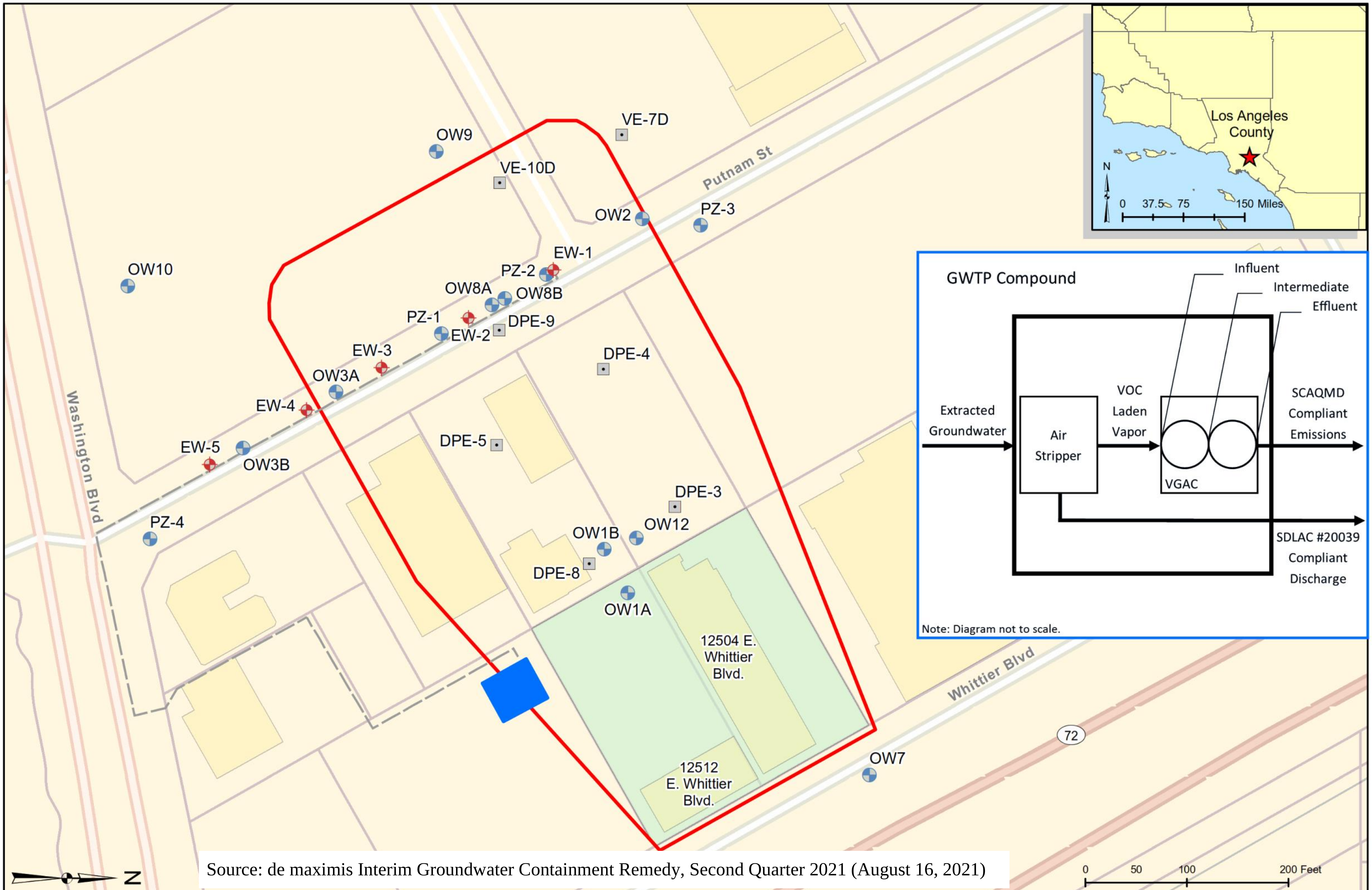
CDM

Source: CDM 2005. Engineering Evaluation and Cost Analysis.

Notes:

1. Added pre-removal action water table based on water levels posted on cross section for water table wells (solid dark blue)..
2. Added current water table based on water levels measured in Second Quarter of 2021 (solid light blue),
3. Added historical high water table based on water levels measured in OW-1A from 1996 to present, projected remaining (dashed purple).

Figure 5b. Cross-Section B-B'



Source: de maximis Interim Groundwater Containment Remedy, Second Quarter 2021 (August 16, 2021)

GCR Extraction Well

Observation Well / Piezometer

OU-1 On-Site Soil Remedy Dual Phase Extraction Well

GCR Conveyance Piping

GWTP Compound Location

Former Omega Chemical Property Boundary

OU-1 Boundary

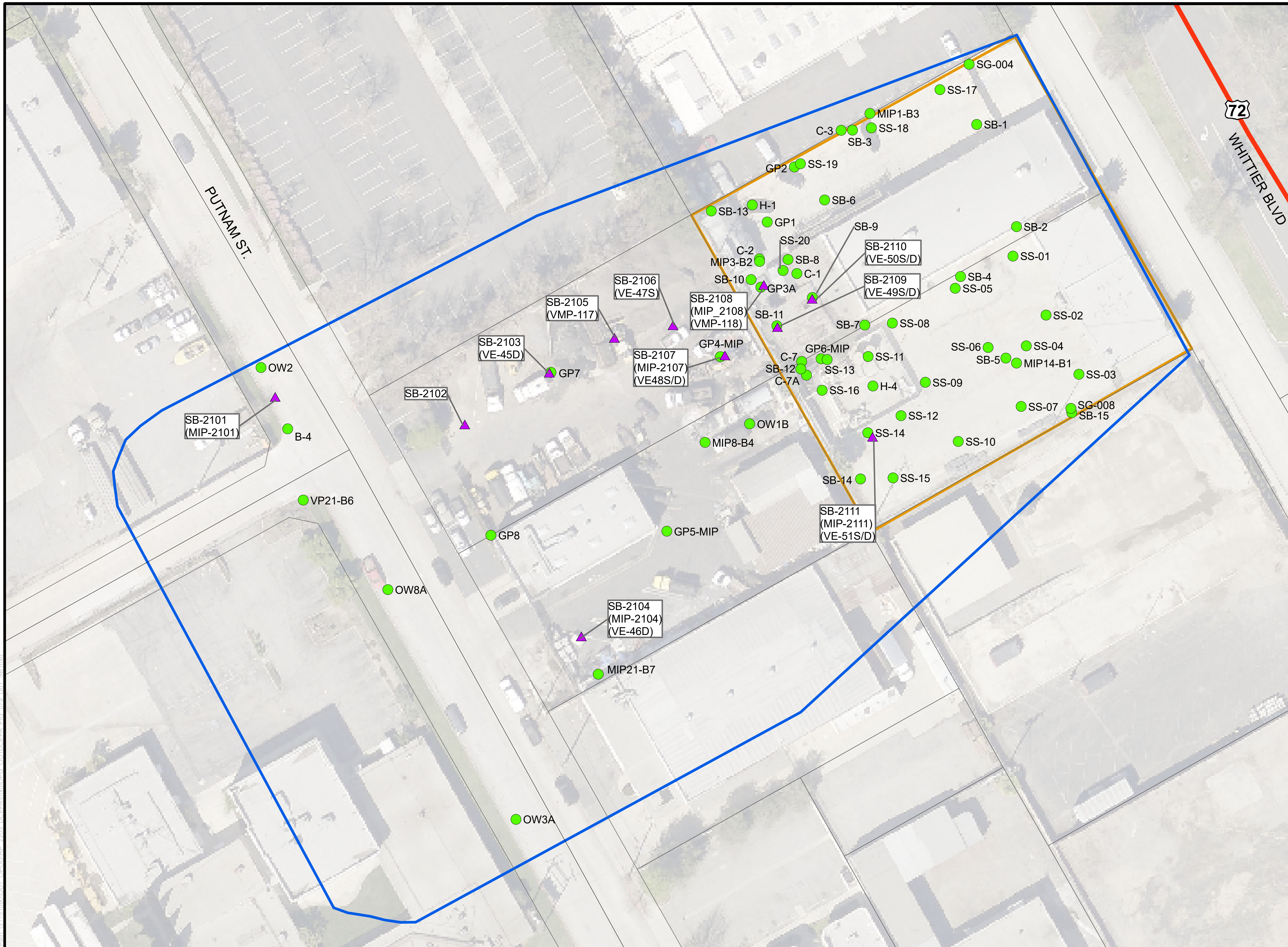
Extraction from VE-7D was terminated on February 11, 2020.The pump will remain off as the value of extraction at this location is limited. Only piezometric data are collected from PZ-3 for GCR performance monitoring.

ddms

de maximis, inc.

Reviewed By: KRK
Drawn By: LEM
Date: 10/27/2020

Figure 6
OU-1 Location Map
OU-1 Groundwater Containment Remedy,
Omega Chemical Superfund Site
12504/12512 East Whittier Boulevard
Whittier, California



EXPLANATION

- HISTORIC SOIL BORING
- RECENT SOIL BORING
- PARCEL BOUNDARIES
- OPERABLE UNIT 1
- FORMER OMEGA CHEMCIAL PROPERTY

NOTES:

Membrane Interface Probes are in close proximity to soil boring.

Vapor Monitoring Probes (VMP) and Soil Vapor Extraction wells (VE) were installed in the same location as soil borings.

Vapor extraction wells are labeled S for shallow if completed within 30 feet of ground surface, or D for deep if completed at depths greather than 30 feet below ground surface.

N

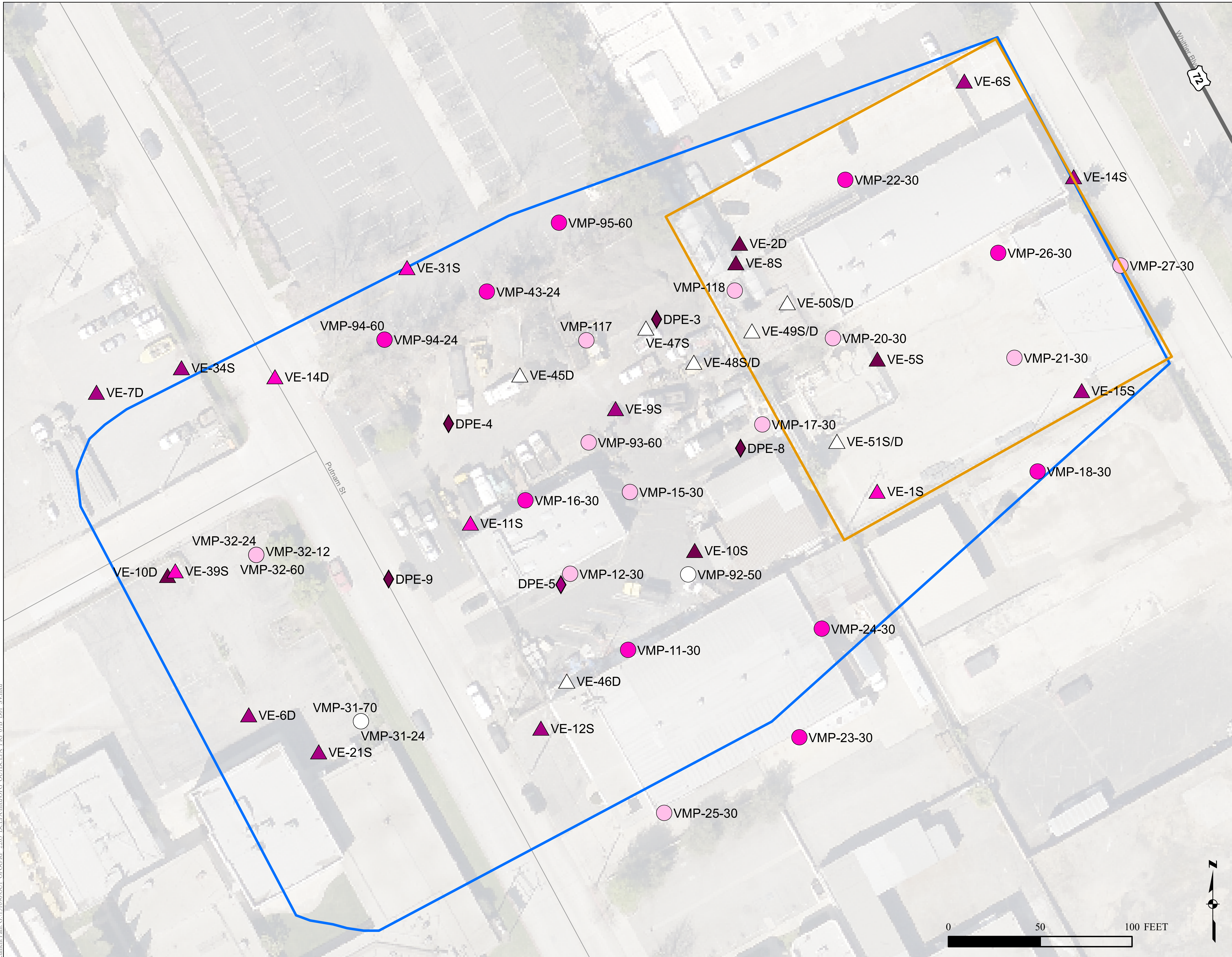
0 25 50 100 Feet

Project No. 151090

4/11/2022

Engineering Analytics, Inc.

FIGURE 7A
RECENT SOIL BORING AND MEMBRANE INTERFACE PROBE LOCATIONS



EXPLANATION

OU1

FORMER OMEGA CHEMICAL PROPERTY

VAPOR MONITORING PROBE

NUMBER OF SAMPLING EVENTS

0

1

2

SOIL VAPOR EXTRACTION WELL

NUMBER OF SAMPLING EVENTS

0

2

3

4

DUAL-PHASE EXTRACTION WELL

NUMBER OF SAMPLING EVENTS

3

4

NOTES:

DPE = DUAL PHASE EXTRACTION WELL
VE = SOIL VAPOR EXTRACTION WELL
VMP = VAPOR MONITORING PROBE
OU-1 = OPERABLE UNIT ONE

VMP-117, VMP-118, AND VE WELLS WITH ZERO SAMPLING EVENTS ARE NEWLY INSTALLED.

FIGURE 7B
RECENT SOIL VAPOR SAMPLING LOCATIONS

DATA COLLECTION PROGRAM
OMEGA OU1

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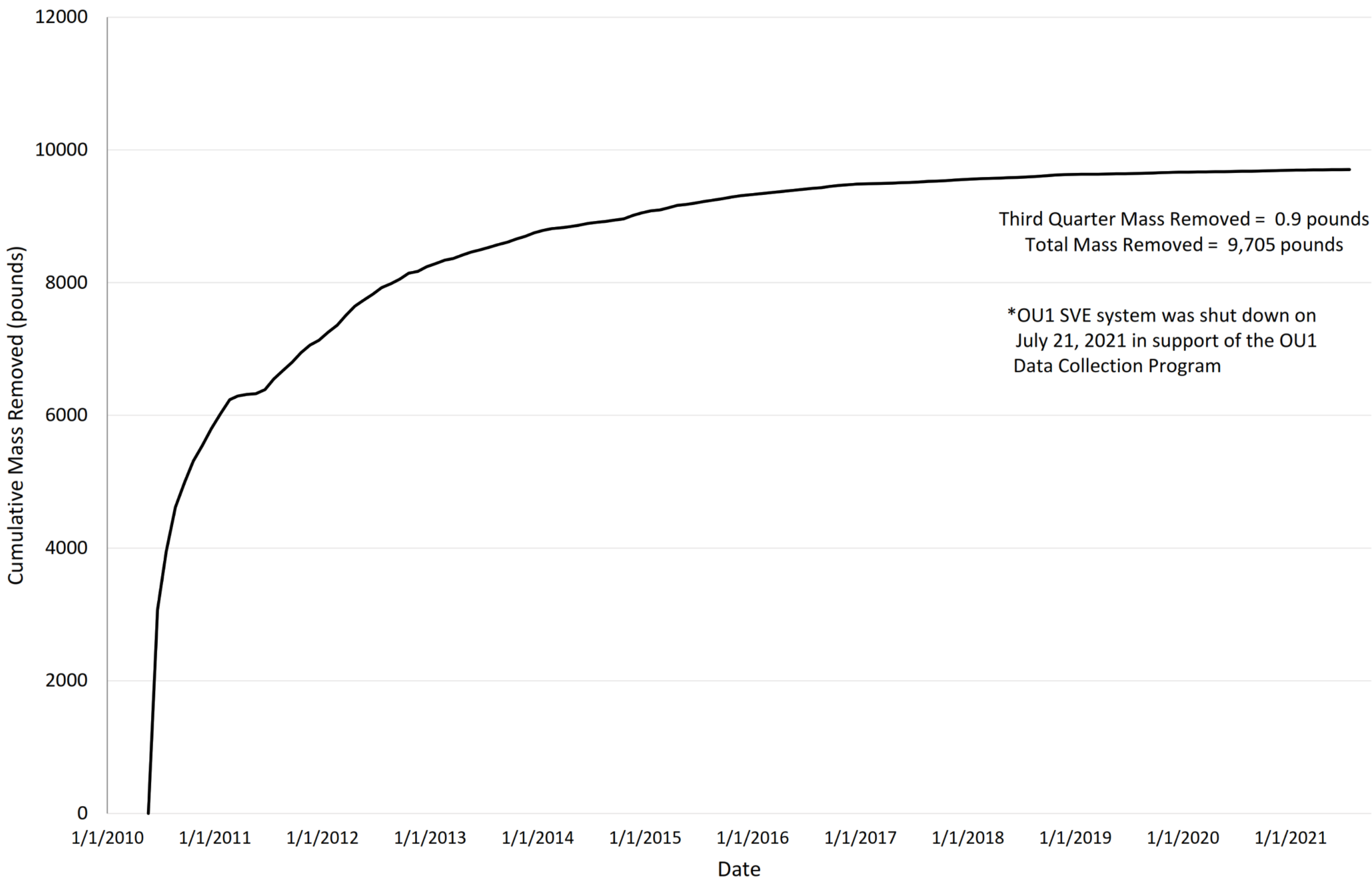
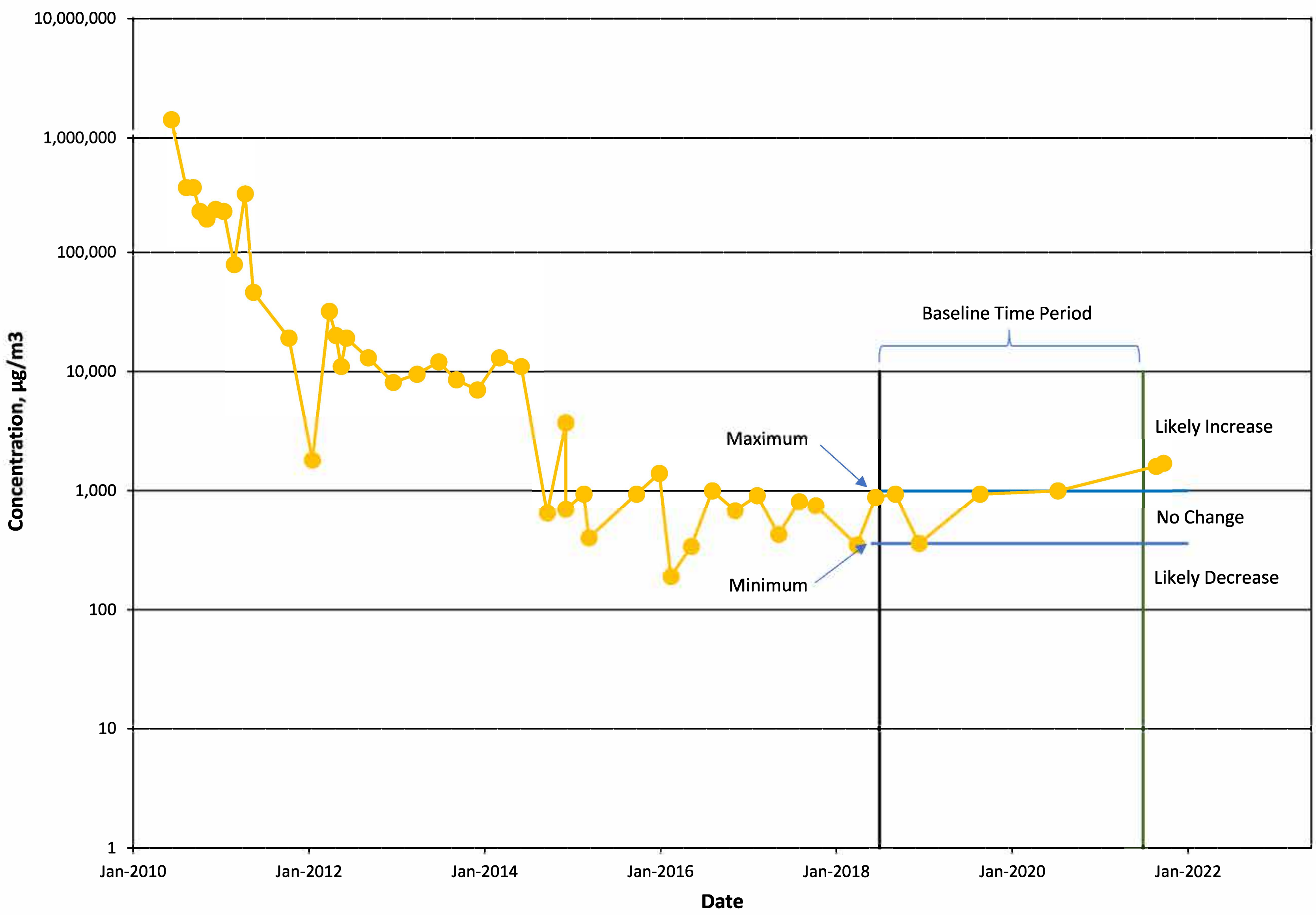
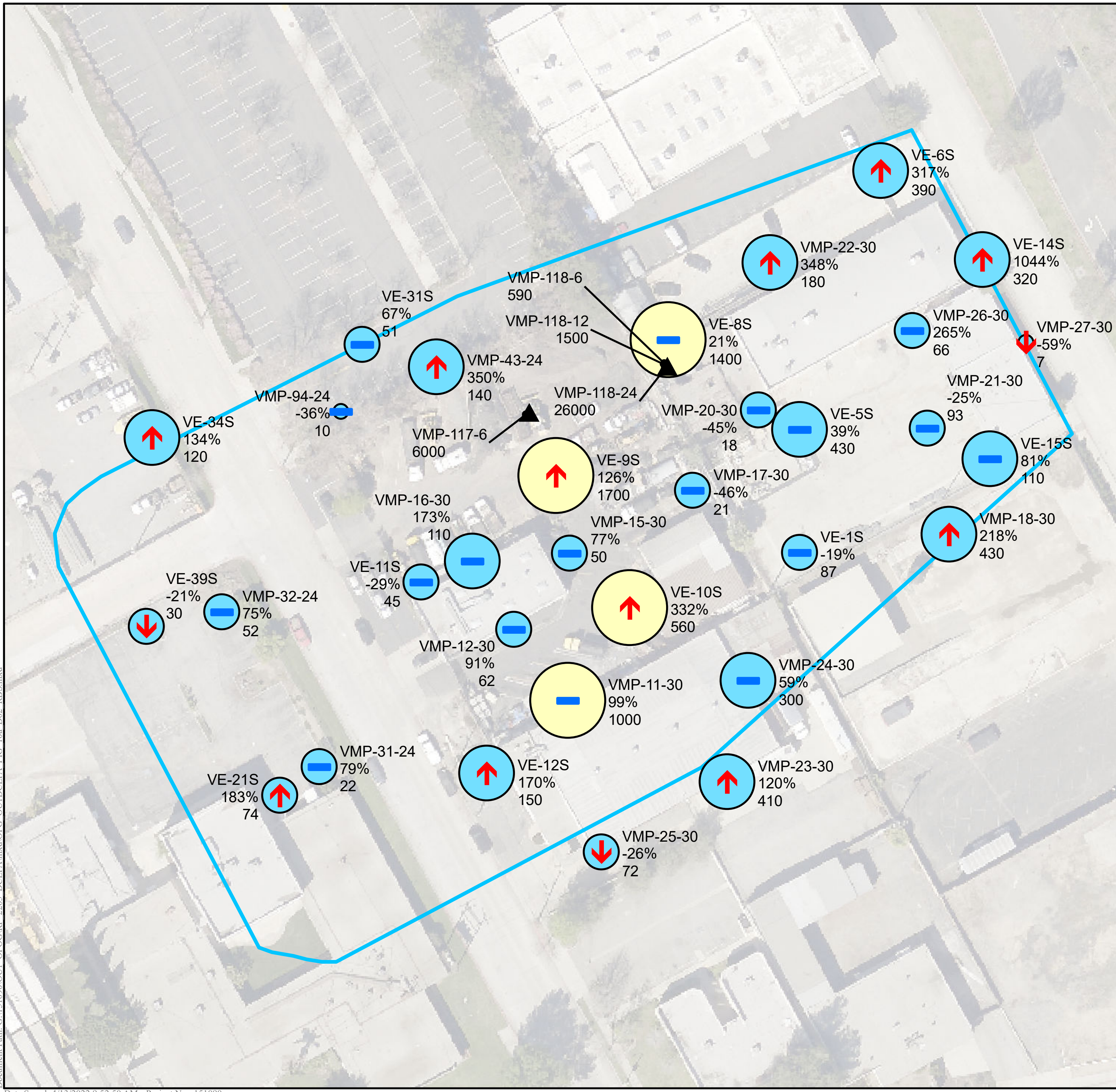
Figure 8
OU-1 SVE System Cumulative Mass Removed
OU-1 Full Scale On-Site Soil Remedy, Omega Chemical Superfund Site
Third Quarter 2021



Source: de maximis Full Scale On-Site Soil Remedy Performance Evaluation Report, Third Quarter 2021 (November 15, 2021)

Figure 9
Illustration of Rebound Characterization Criteria





LEGEND

OPERABLE UNIT 1

RECENTLY INSTALLED VMP
PCE RESULT (UG/M3)

SHALLOW EXTRACTION WELL

WELL ID
% CHANGE FROM GEOMEAN
MAX REBOUND PCE RESULT (µg/m3)

PCE, MAXIMUM REBOUND RESULT (µg/m3)

GREATER THAN OR EQUAL TO 470
100 to <470
10 to <100
<10

MAXIMUM REBOUND EVALUATION VAPOR MONITORING POINTS AND EXTRACTION WELLS

LIKELY INCREASE
NO CHANGE
LIKELY DECREASE

Note:
VMP = Vapor Monitoring Point
PCE = Tetrachloroethene
µg/m3 = micrograms per cubic meter
% = percent

N

0 40 80 FEET

FIGURE 10A
SOIL VAPOR REBOUND RESULTS FROM SHALLOW MONITORING POINTS

DATA COLLECTION PROGRAM
OMEGA OU1

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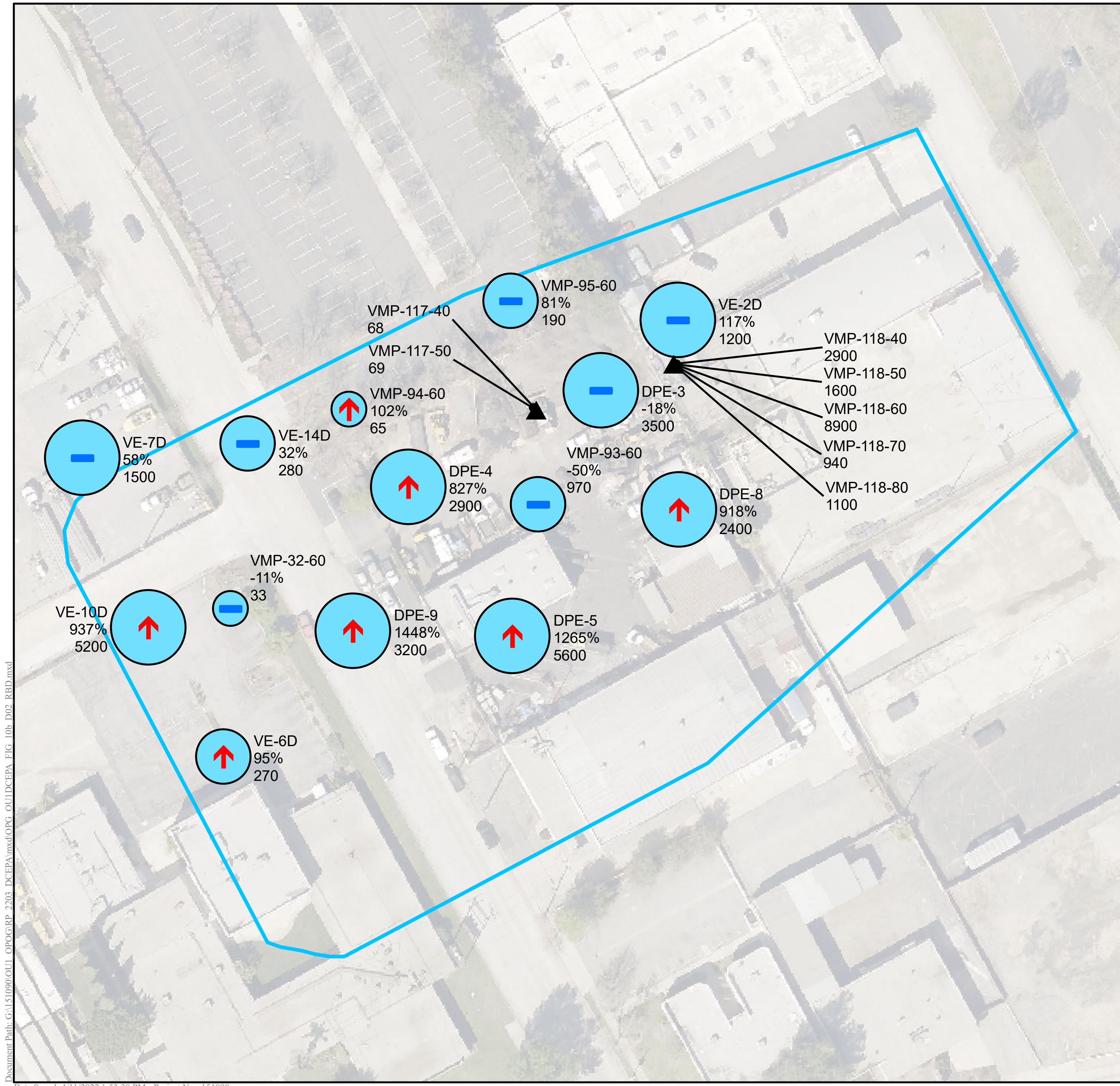

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LEGEND

OPERABLE UNIT 1

RECENTLY INSTALLED VMP
PCE RESULT (UG/M3)

DEEP EXTRACTION WELL

WELL ID
% CHANGE FROM GEOMEAN
MAX REBOUND PCE RESULT (µg/m3)

PCE, MAXIMUM REBOUND RESULT (µg/m3)

GREATER THAN OR EQUAL TO 1,000
100 to <1,000
10 to <100
<10

MAXIMUM REBOUND EVALUATION VAPOR MONITORING POINTS AND EXTRACTION WELLS

LIKELY INCREASE
NO CHANGE
LIKELY DECREASE

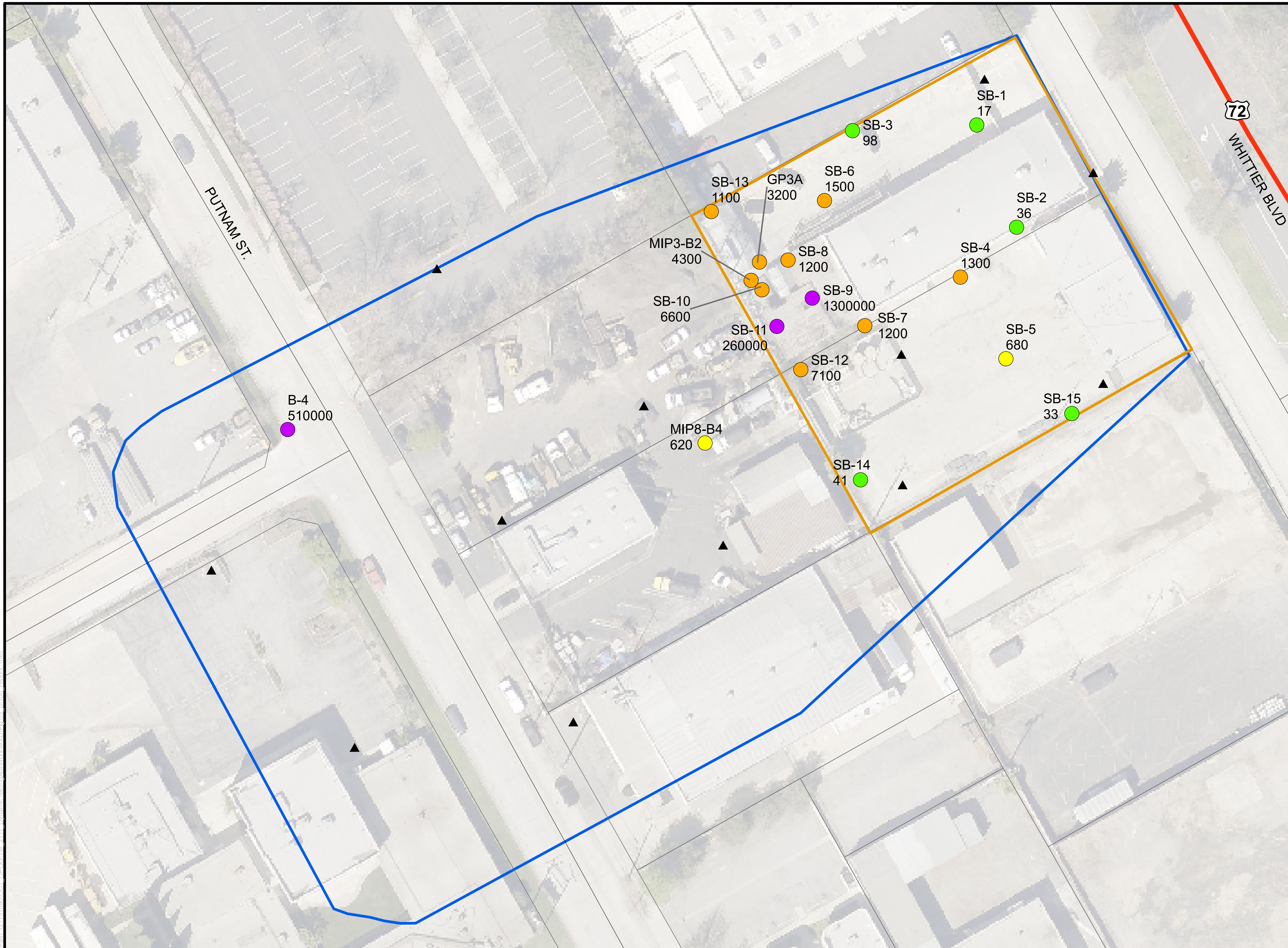
Note:
SVE = Soil Vapor Extraction
VMP = Vapor Monitoring Point
PCE = Tetrachloroethene
µg/m3 = micrograms per cubic meter
lbs - pounds
% = percent

N

0 40 80 FEET

FIGURE 10B: SOIL VAPOR REBOUND RESULTS FROM DEEP MONITORING POINTS

DATA COLLECTION PROGRAM
OMEGA OU1



EXPLANATION

Soil Boring

Pre-Remediation — BORING ID / PCE CONCENTRATION

PCE Concentration

- Non-Detect, Greater than 10 µg/kg
- Non-Detect, Less than or equal to 10 µg/kg
- Detected, Less than or equal to 1 µg/kg
- >1 to 10 µg/kg
- >10 to 100 µg/kg
- >100 to 1,000 µg/kg
- >1,000 to 10,000 µg/kg
- >10,000 to 100,000 µg/kg
- >100,000 µg/kg

- Shallow Soil Vapor Extraction Well
- Parcel Boundaries
- Operable Unit 1
- Former Omega Chemcial Property

Notes:
- The concentration posted is the maximum PCE concentration within the depth interval for the respective soil boring.
- Recent samples collected in August and September 2021.
- Aerial photograph is from USGS Earth Explorer, 2013.
- PCE = Tetrachloroethene
- µg/kg = micrograms per kilogram
- BGS = Below Ground Surface
- no soil sample was collected at SB-2104 due to focus on adjacent depth interval

N

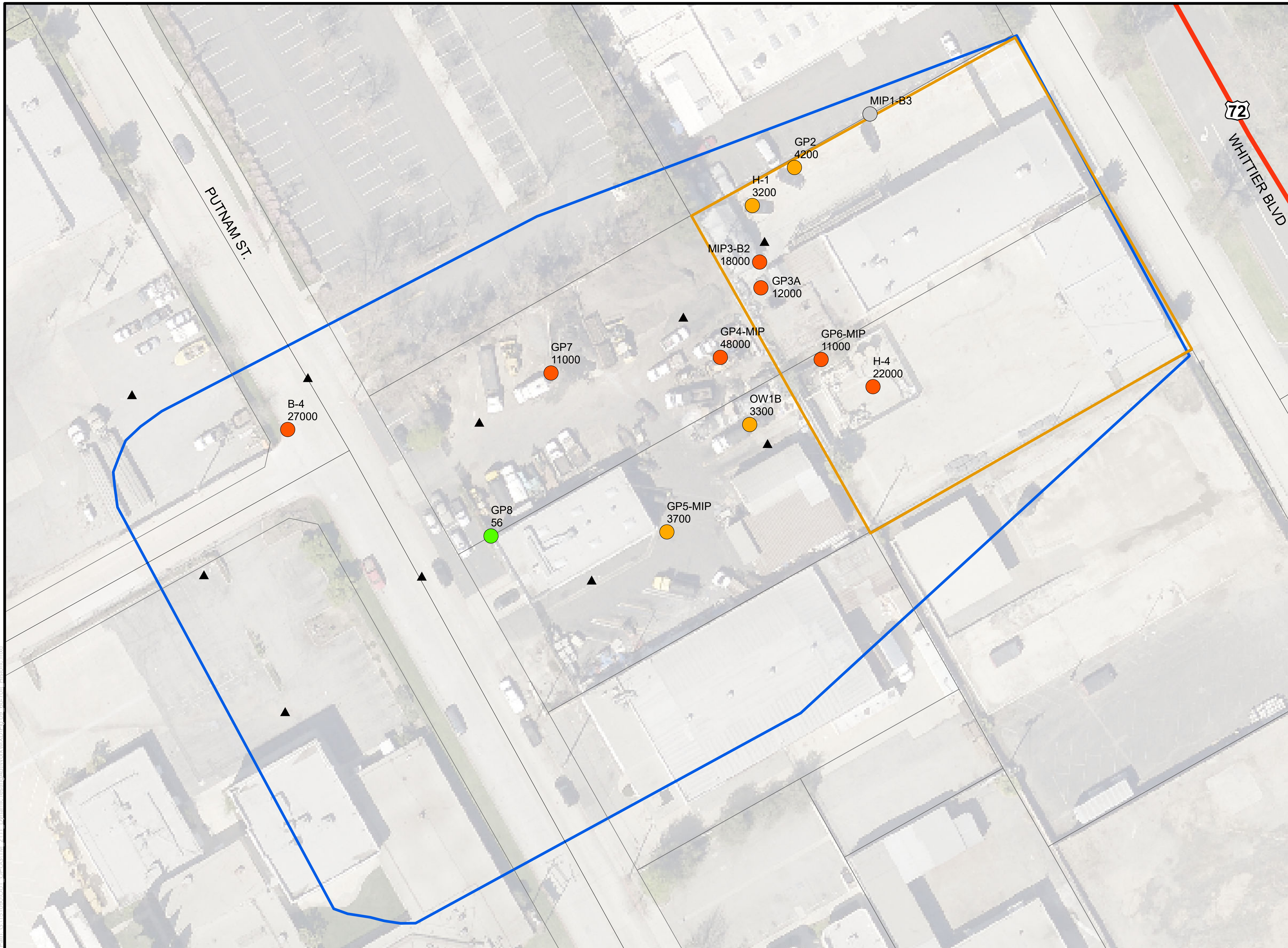
0 25 50 100 Feet

Project No. 151090

4/11/2022

Engineering Analytics, Inc.

FIGURE 11A
PRE-REMEDIATION, TETRACHLOROETHENE CONCENTRATION IN SOIL FROM 0 TO 10 FEET BGS



EXPLANATION

Soil Boring

Pre-Remediation — BORING ID / PCE CONCENTRATION

PCE Concentration

- Non-Detect, Greater than 10 µg/kg
- Non-Detect, Less than or equal to 10 µg/kg
- Detected, Less than or equal to 1 µg/kg
- >1 to 10 µg/kg
- >10 to 100 µg/kg
- >100 to 1,000 µg/kg
- >1,000 to 10,000 µg/kg
- >10,000 to 100,000 µg/kg
- >100,000 µg/kg

- Deep Soil Vapor Extraction Well
- Parcel Boundaries
- Operable Unit 1
- Former Omega Chemcial Property

Notes:
- The concentration posted is the maximum PCE concentration within the depth interval for the respective soil boring.
- Recent samples collected in August and September 2021.
- Aerial photograph is from USGS Earth Explorer, 2013.
- PCE = Tetrachloroethene
- µg/kg = micrograms per kilogram
- BGS = Below Ground Surface
- No soil sample was collected at SB-2110 due to focus on adjacent depth interval

N

0 25 50 100 Feet

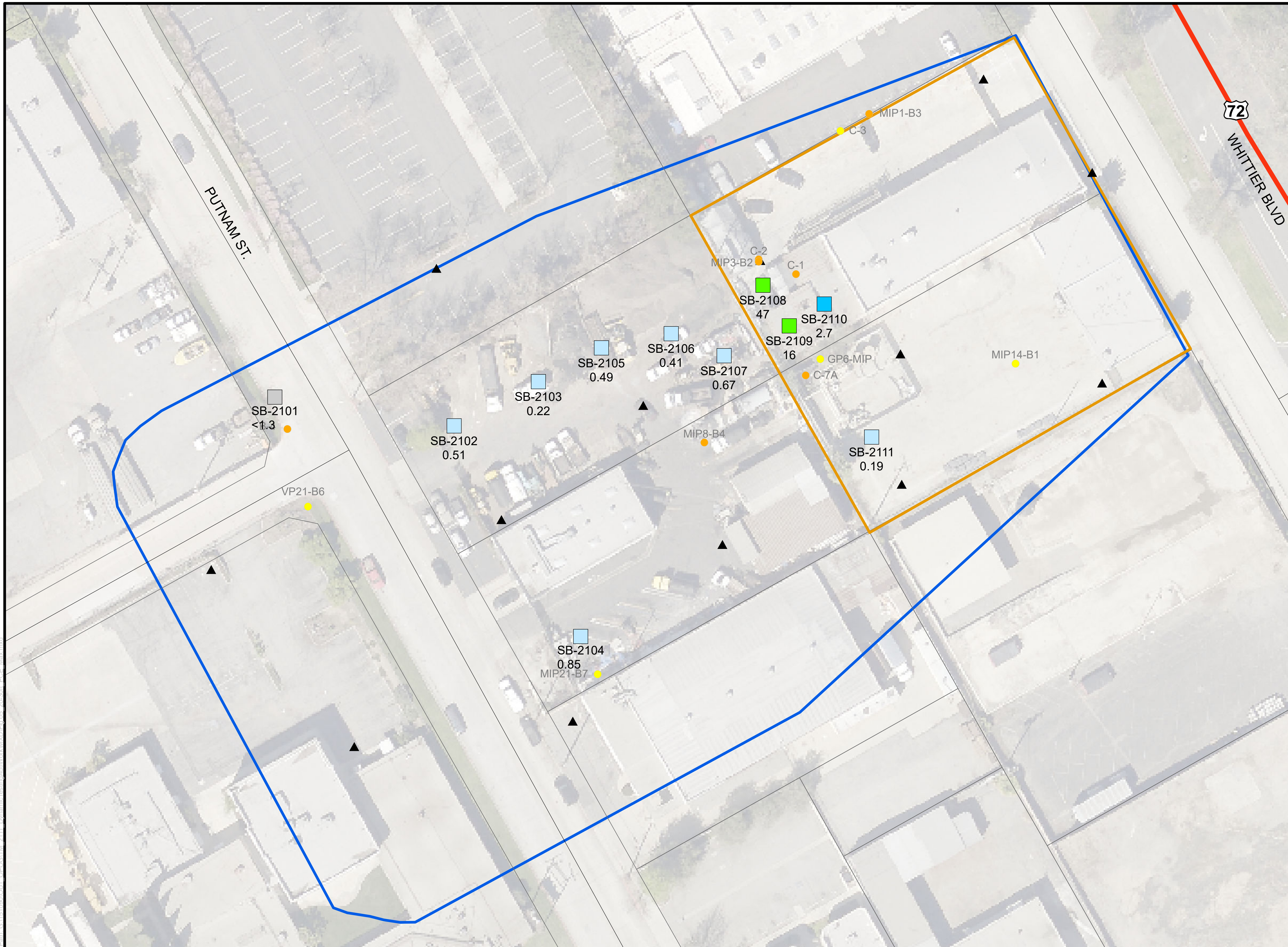
Project No. 151090

4/11/2022

Engineering Analytics, Inc.

FIGURE 11b

PRE-REMEDIATION, TETRACHLOROETHENE CONCENTRATION IN SOIL FROM 60 TO 70 FEET BGS



EXPLANATION

Soil Boring

Pre-Remediation ○ BORING ID

Recent □ BORING ID
PCE CONCENTRATION

PCE Concentration

- Non-Detect, Greater than 10 µg/kg
- Non-Detect, Less than or equal to 10 µg/kg
- Detected, Less than or equal to 1 µg/kg
- >1 to 10 µg/kg
- >10 to 100 µg/kg
- >100 to 1,000 µg/kg
- >1,000 to 10,000 µg/kg
- >10,000 to 100,000 µg/kg
- >100,000 µg/kg

▲ Shallow Soil Vapor Extraction Well

Parcel Boundaries

Operable Unit 1

Former Omega Chemcial Property

Notes:
- The concentration posted is the maximum PCE concentration within the depth interval for the respective soil boring.
- Recent samples collected in August and September 2021.
- Aerial photograph is from USGS Earth Explorer, 2013.
- PCE = Tetrachloroethene
- µg/kg = micrograms per kilogram
- BGS = Below Ground Surface

N

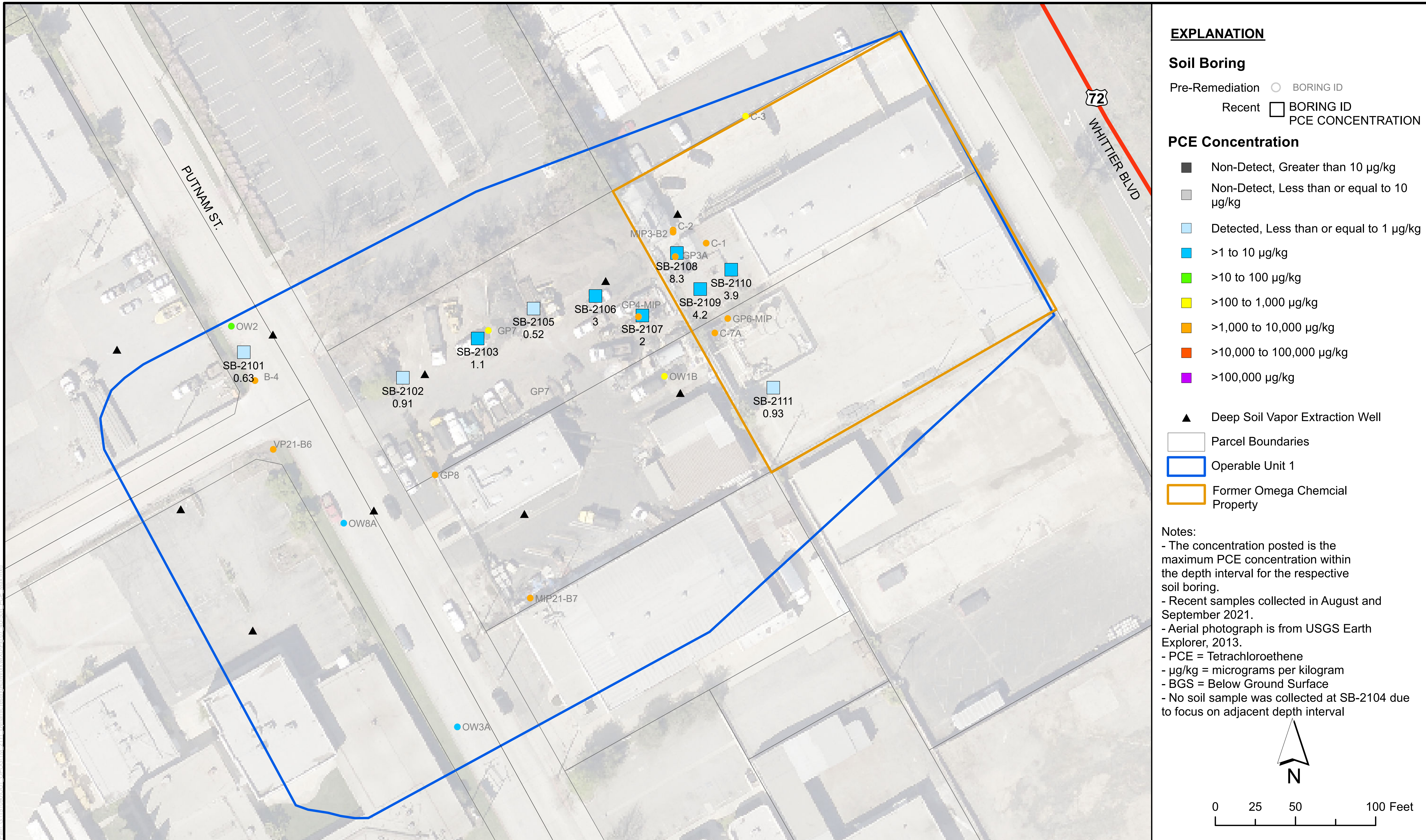
0 25 50 100 Feet

Project No. 151090

4/11/2022

Engineering Analytics, Inc.

FIGURE 12a
RECENT TETRACHLOROETHENE CONCENTRATION IN SOIL FROM 20 TO 30 FEET BGS



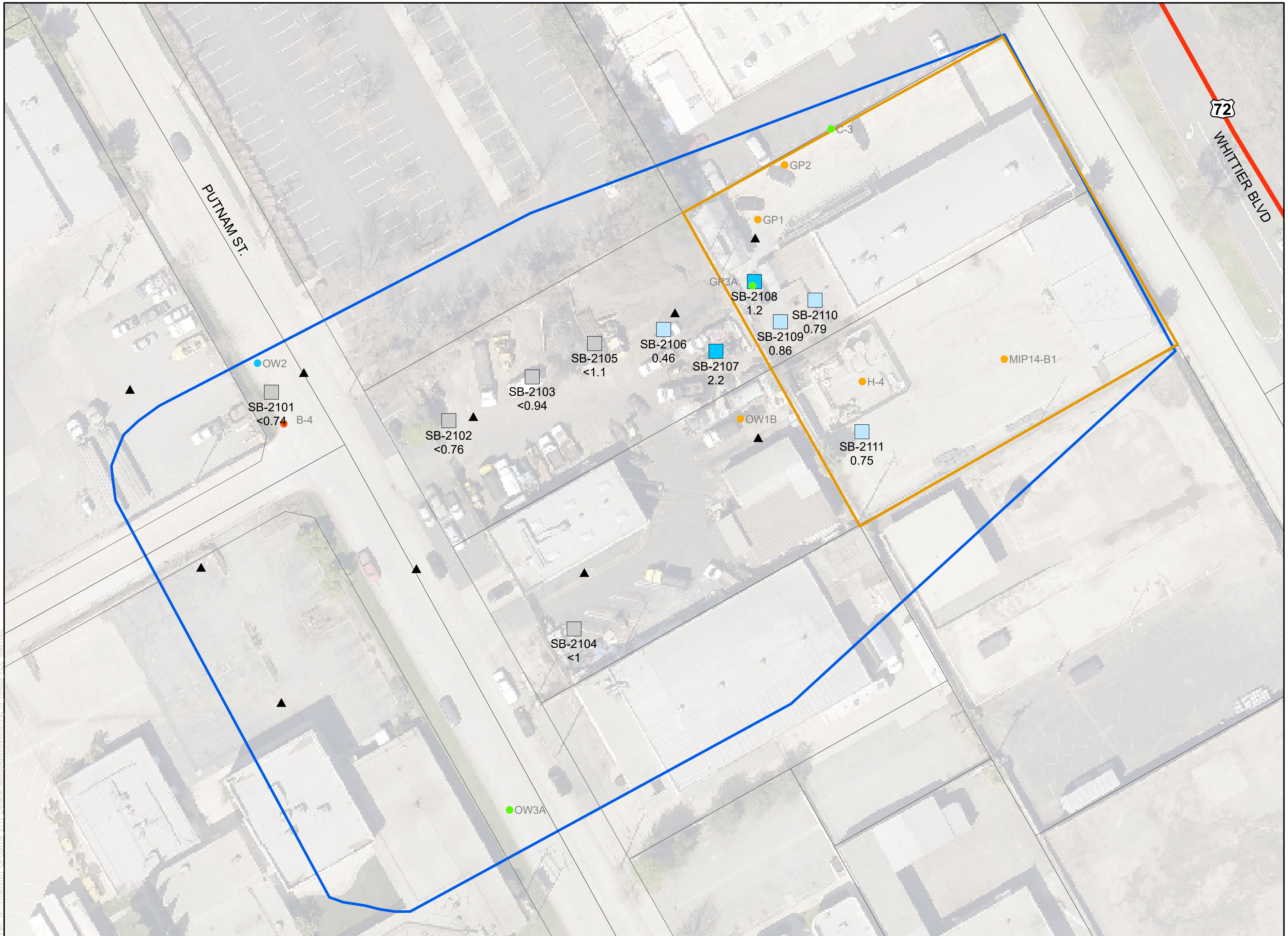
Project No. 151090

4/11/2022

Engineering Analytics, Inc.

FIGURE 12b

RECENT TETRACHLOROETHENE CONCENTRATION IN SOIL FROM 40 TO 50 FEET BGS



EXPLANATION

Soil Boring

Pre-Remediation ○ BORING ID

Recent ☐ BORING ID PCE CONCENTRATION

PCE Concentration

- Non-Detect, Greater than 10 µg/kg
- Non-Detect, Less than or equal to 10 µg/kg
- Detected, Less than or equal to 1 µg/kg
- >1 to 10 µg/kg
- >10 to 100 µg/kg
- >100 to 1,000 µg/kg
- >1,000 to 10,000 µg/kg
- >10,000 to 100,000 µg/kg
- >100,000 µg/kg

▲ Deep Soil Vapor Extraction Well

Parcel Boundaries

Operable Unit 1

Former Omega Chemcial Property

Notes:
- The concentration posted is the maximum PCE concentration within the depth interval for the respective soil boring.
- Recent samples collected in August and September 2021.
- Aerial photograph is from USGS Earth Explorer, 2013.
- PCE = Tetrachloroethene
- µg/kg = micrograms per kilogram
- BGS = Below Ground Surface

N

0 25 50 100 Feet

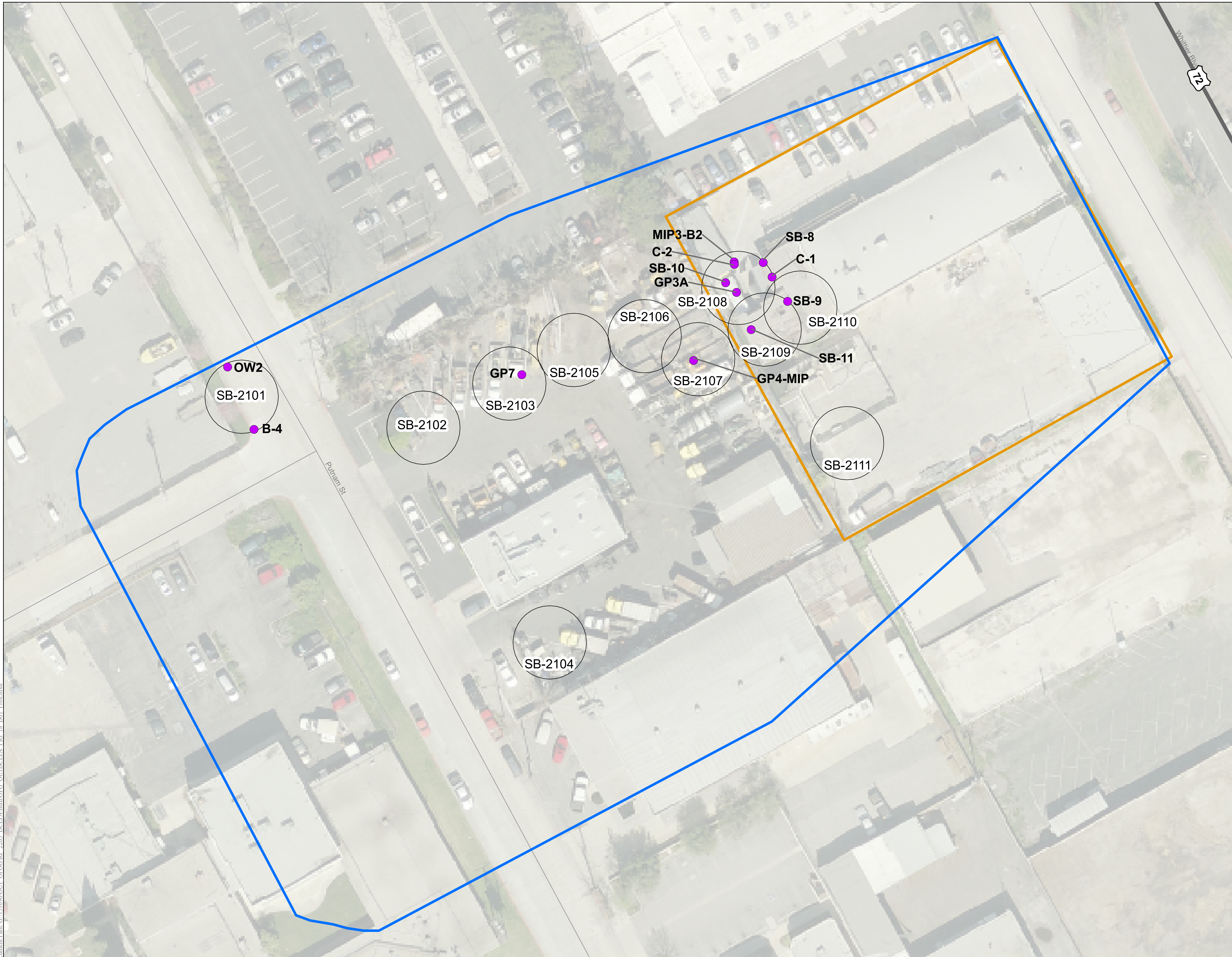
Project No. 151090

4/11/2022

Engineering Analytics, Inc.

FIGURE 12c

RECENT TETRACHLOROETHENE CONCENTRATION IN SOIL FROM 70 TO 80 FEET BGS



EXPLANATION

OU1 Boundary

Operable Unit 1 based on Record of Decision

Pre-Remediaion Soil Sample

Pre-remediation soil sample location within 20 foot buffer of OU1 data collection soil boring

OU1 Data Collection Soil Boring Proximity

20 foot radius around OU1 data collection soil boring

Former Omega Chemical Property

NOTES:

UC- AND VP- = SOIL GAS SAMPLE POINT
VE = SOIL VAPOR EXTRACTION WELL
VMP = VAPOR MONITORING PROBE
OU-1 = OPERABLE UNIT ONE

N

0 50 100 FEET

FIGURE 13
PRE-REMEDIATION SOIL BORINGS PROXIMAL TO OPERABLE UNIT 1 DATA COLLECTION SOIL BORINGS

DATA COLLECTION PROGRAM
OPERABLE UNIT 1

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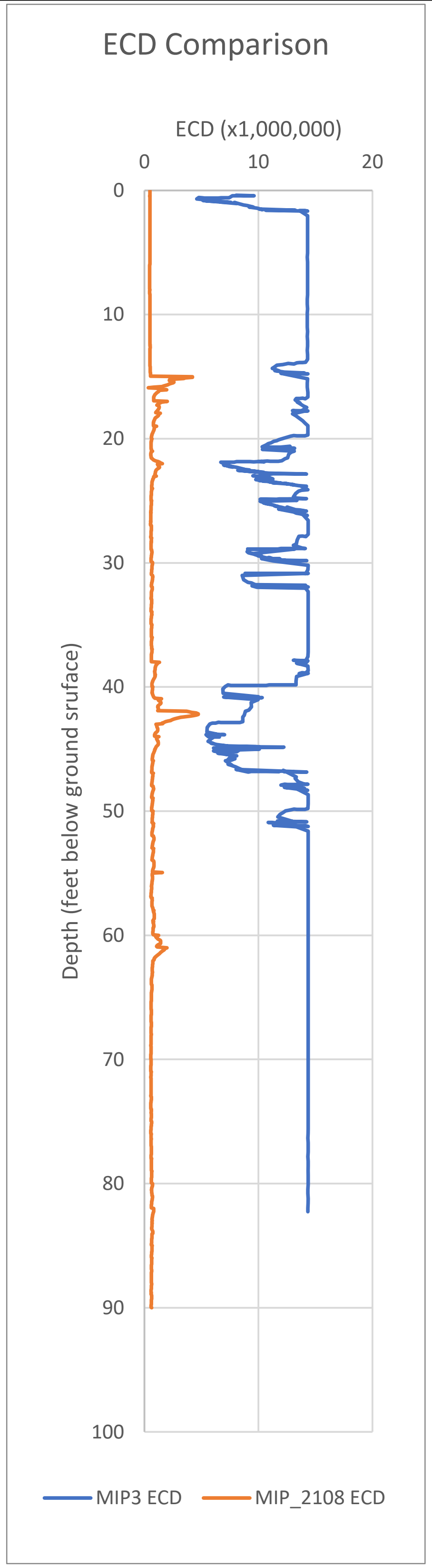
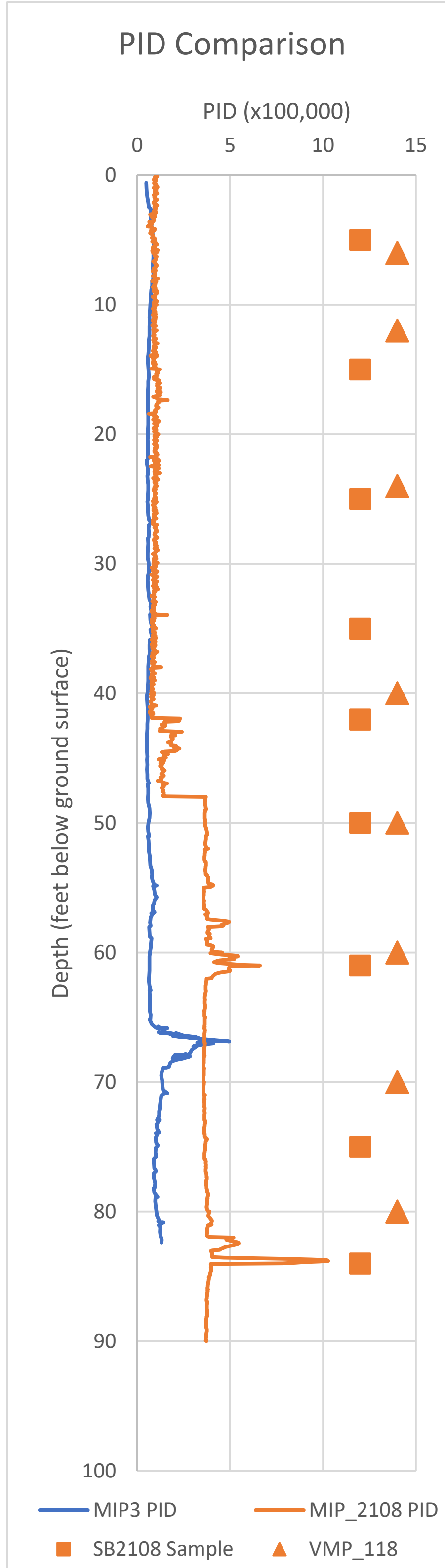
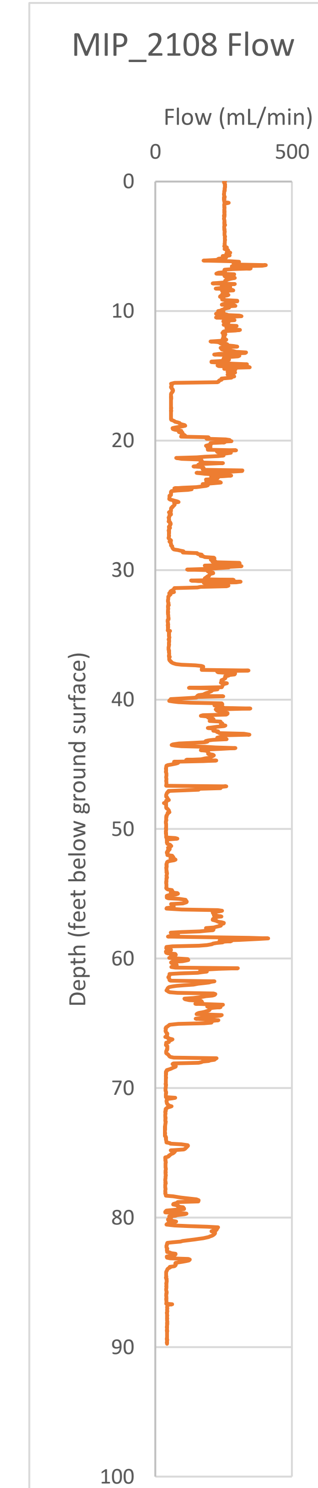




RECENT RESULTS					
Soil Sample Results				Soil Vapor	
Micrograms per kilogram		unitless	percent	Micrograms per cubic meter	
PCE	Total VOCs	foc	Moisture	PCE	Total VOCs
0.99	36.4			590	6858
		0.00159	9.1		
6.9	7.25			1500	6995
		0.00170	8.8		
47	47.67			26000	28110
		0.00235	14		
18	31.4				
		0.00156	14	2900	3848
8.3	185.73				
2.5	22.39	0.00155	13	1600	4255
2.9	34.19	0.00221	16	8900	11421
		0.00237	11	940	2206
1.2	253.3				
		<0.00100	15		
0.9	44.9			1100	4970
		0.000658	16		

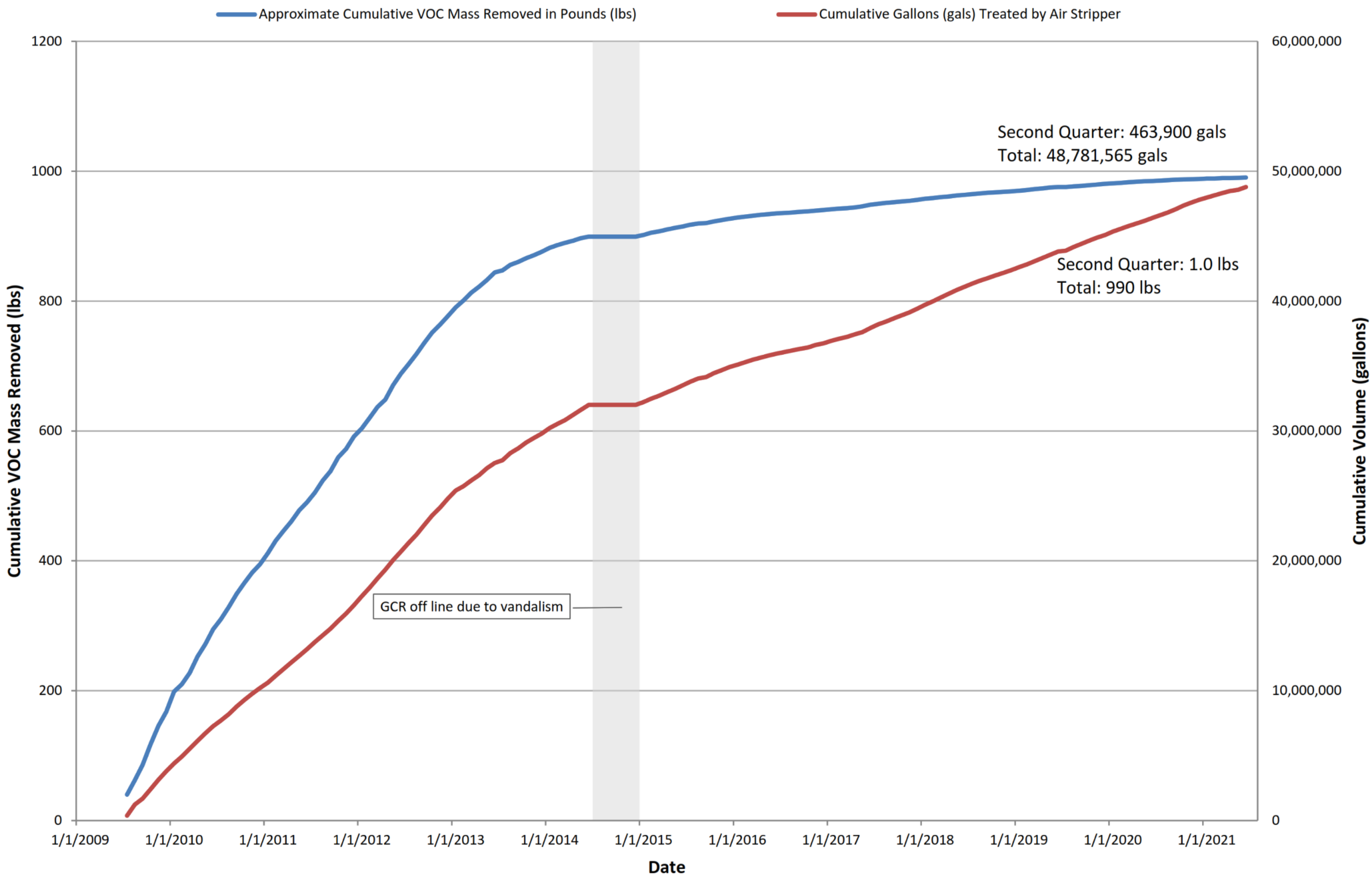


Pre-remediation = MIP3
Recent (Third quarter 2021) = MIP_2108

ECD = Electron capture device
PID = Photoionization device
VMP = Vapor monitoring probe
mL/min = milliliters per minute
Sample = Depth of sample for volatile organic compound analysis
MIP = Membrane interface probe
VOC = Volatile organic compounds
PCE = Tetrachloroethene
foc = fractional organic carbon

FIGURE 14. Recent Tetrachloroethene, Total Volatile Organic Compounds, Fractional Organic Carbon and Percent Moisture MIP/SB2108

Figure 15
Cumulative Gallons Treated and Mass Removed
OU-1 Groundwater Containment Remedy, Omega Chemical Superfund Site
Second Quarter 2021



Source: de maximis Interim Groundwater Containment Remedy, Second Quarter 2021 (August 16, 2021)

APPENDIX A
OPERABLE UNIT 1 DATA COLLECTION PROGRAM FIELD IMPLEMENTATION REPORT

APPENDIX A

FIELD IMPLEMENTATION REPORT
OPERABLE UNIT 1 DATA COLLECTION
OMEGA CHEMICAL CORPORATION SUPERFUND SITE
WHITTIER, CALIFORNIA

Prepared for:

Omega Chemical Site

Potentially Responsible Parties Organized Group

Prepared by:

Engineering Analytics, Inc.

9820 Willow Creek Rd., Suite 395
San Diego, CA 92131
(858) 221-0264

Project No. 151090

APRIL 14, 2022

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ACRONYMS AND ABBREVIATIONS

bgs	Below ground surface
CDM Smith	CDM Smith, Inc (formerly Camp Dresser & McKee, Inc [CDM])
ddms	de maximis Data Management Solutions
de maximis	de maximis, Inc.
DCP	Data Collection Program
DPE	Dual Phase Extraction
DTSC	Department of Toxic Substances Control
EA	Engineering Analytics, Inc.
ECD	Electron Capture Detector
GCR	Groundwater Containment Remedy
IDW	Investigation-Derived Waste
MIP	Membrane Interface Probe
OM&M	Operations, Maintenance and Monitoring
OPOG	Omega Chemical Site PRP Organized Group
OSS	On-Site Soil
OU1	Operable Unit 1
OU1 SVE system	Operable Unit 1 Soil Vapor Extraction System
PID	Photoionization Detector
QA	Quality Assurance
QA/QC	Quality Assurance Project Plan and Quality Assurance/Quality Control
QC	Quality Control
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
Site	Omega Chemical Corporation Superfund Site
SOP	Standard Operating Procedure
SVE	Soil Vapor Extraction
TOC	Total Organic Carbon
USEPA	United States Environmental Protection Agency
VMP	Vapor Monitoring Probe
VOCs	Volatile Organic Compounds

1.0 INTRODUCTION

This Field Implementation Report was prepared by Engineering Analytics, Inc. (EA) on behalf of the Omega Chemical Site Potentially Responsible Parties Organized Group (OPOG) to summarize data collection activities associated with the Operable Unit 1 (OU1) data collection program (OU1 DCP) for the Omega Chemical Corporation Superfund Site (Site) (Figure A-1).

1.1 Objectives

The OU1 DCP was a voluntary data collection program implemented by OPOG. The general approach and objectives of the OU1 DCP were outlined in a technical memorandum submitted to the United States Environmental Protection Agency (USEPA) in March 2021 (EA, 2021). EPA acknowledged the OU1 DCP and approved temporary shutdown of the OU1 soil vapor extraction system (OU1 SVE system) and groundwater containment remedy (GCR) to facilitate the DCP effort (USEPA, 2021). The general objectives of the OU1 DCP that are relevant to this report include:

- Collect soil matrix and soil gas concentration data to evaluate SVE remediation progress.
- Determine the current distribution of residual volatile organic compound (VOC) mass/concentrations in former high concentration portions of the unsaturated and saturated zones.

1.2 Sampling and Analysis Methods

Multiple Sampling and Analysis Plans (SAPs) have been prepared to support OU1 activities which have been reviewed and approved by USEPA. These SAPs include Quality Assurance Project Plans and Quality Assurance/Quality Control (QA/QC) procedures; data review, validation, and verification procedures; and data management plans. To maintain consistency in data collection, standard operating procedures (SOPs), analysis, QA, and data management of relevant portions of the following approved SAPs and/or Field Sampling Plans were used during OU1 DCP implementation:

- On-Site soils (OSS) Remedial Investigation (RI)/Feasibility Study Work Plan (CDM, 2003);
- OSS Remedial Design/Remedial Action SAP (CDM, 2010b);
- OU1 SVE System Operations, Maintenance and Monitoring (OM&M) Manual (CDM Smith, 2018b);
- 2020 Indoor Air Quality Sampling Plan (de maximis, inc., [de maximis], 2020);
- The OM&M Manual, Appendix G is being revised to update SAPs for both the OSS OU1 SVE system and the GCR, which USEPA has reviewed and confirmed final comments.

2.0 FIELD IMPLEMENTATION TASKS

The methods and procedures for the tasks included in this Section are briefly described in the following. The field activities were initiated in July 2021 with temporary shutdown of the OU1 SVE system and were completed in February 2022.

2.1 OU1 SVE System Shut-Down

In accordance with USEPA approval for SVE shutdown, the Project Coordinator notified the USEPA Project Manager within 48-hours of shutting down each system (USEPA, 2021, de maximis, 2021a and 2021b). The OU1 SVE system was turned off to allow for soil vapor rebound testing.

2.2 Pre-Field Activities

Access to the Site was obtained prior to the initiation of each field event. Standard utility verification procedures were followed for the locations, including a notification to Underground Service Alert, screening drilling locations for subsurface obstructions by a licensed geophysical utility locating service and clearance of the upper ten feet of each borehole using a hand auger. The County of Los Angeles Public Health indicated that permits for soil borings, vapor monitoring probes (VMPs), and SVE/dual phase extraction (DPE) wells were not required since the work was conducted in an operable unit of a USEPA Superfund Site. An encroachment permit and a traffic control plan were prepared for work conducted on Putnam Street. An on-Site staging area was established for the storage of materials, equipment, and investigation-derived wastes (IDW). Field operations were performed with minimal impact on the Site. The relevant work areas were returned to pre-work conditions as part of the demobilization process.

2.3 Indoor Air

The OU1 SVE system was shut down to allow the planned optimization soil vapor rebound testing to occur. Indoor air monitoring was performed in all occupied structures within OU1 in October 2021 and January 2022 (Table A-1) to monitor indoor air concentrations relative to the approved indoor air risk-based standards while the OU1 SVE system was off to accommodate soil vapor rebound testing. Indoor air monitoring was performed using the previously-established and USEPA-approved indoor air sampling procedures and plans (CDM Smith, 2018; de maximis, 2020), which are fully consistent with Department of Toxic Substances Control (DTSC) guidance (DTSC, 2011).

2.4 Rebound Tests

The potential rebound or change in soil gas VOC concentrations over time was evaluated by collecting soil gas samples from SVE and DPE wells and VMPs while the OU1 SVE system was off. The rate and magnitude of soil gas VOC concentration rebound measured during static tests provides an indication of the presence of residual mass in proximity to each test location and an indication of the ability for the OSS remedy to attain performance goals. The rate and magnitude of vapor concentration change during dynamic rebound testing provides information on potential optimization measures through cycled operation of SVE/DPE wells. The static and dynamic soil gas samples were analyzed for VOCs using EPA Method TO-15 (Table A-2).

2.4.1 Static Rebound Tests

Static rebound samples were collected by purging small volumes of vapor from SVE/DPE wells and VMPs. Static rebound testing was conducted in month 1 (August 2021), month 2 (September 2021[1]) and month 6[2] (January 2022) (Table A-1). During months 1 and 2, static sampling of all OU1 SVE/DPE wells was conducted (Table A-3). During month 2, static sampling included selected VMPs that were previously sampled and analyzed for VOCs during OU1 SVE system operation, and were located throughout OU1 (Table A-3). Static rebound testing was also conducted in month 6 to provide coverage throughout OU1 (Table A-3).

Static rebound resting was be performed as follows:

- Static rebound samples from SVE and DPE wells:
  - The Field Implementation Team confirmed that all SVE and DPE wellhead isolation valves connected to the vapor collection pipeline were closed.
  - A purge pump capable of extracting approximately 1 standard cubic foot per minute was connected to the existing vapor manifold. This flow rate was selected as it is relatively low compared to routine operating flow rates but sufficiently high to purge the pipeline and well in a reasonable period of time. The sample set up allowed for operation of the purge pump and subsequent isolation of the purge pump from the vapor sampling equipment, which was located between the purge pump and the existing vapor manifold.
  - Prior to initiating purging at each SVE/DPE well, the Field Implementation Team conducted a shut-in test to verify that no leaks were present in in the sampling equipment.
  - For the tested SVE/DPE well, the Field Implementation Team purged three pipeline and well casing volumes using the purge pump.
  - After three purge volumes were removed, the Field Implementation Team collected samples.
- VMP sampling:
  - The Field Implementation Team collected soil gas samples at VMPs in accordance with existing SOPs for VMP sampling.
- The samples were package and transported daily to the laboratory for analysis of VOCs using EPA Method TO-15 (Table A-2).

2.4.2 Dynamic Rebound Tests

Dynamic vapor rebound testing conducted in month 3 (Table A-1) involved operating selected SVE/DPE wells for approximately 8 hours and collecting soil gas samples after approximately 1

[1] One sample was collected on October 1, 2021.
[2] There was a resample of VE-9S conducted on February 4, 2022 to assess the relatively low concentration of tetrachloroethene in the January 2022 sample.

hour and 8 hours of operation (Table A-3). The selected SVE/DPE wells were operated at flow rates similar to those historically used during routine operation of the OU1 SVE system. In addition, five of the selected SVE/DPE wells were tested to assess the upper end of potential SVE flow rates (pneumatic testing). This was accomplished by operating the selected SVE/DPE well at the maximum achievable flow rate for approximately one hour after the dynamic test at the respective well was completed. Flow rate and vacuum were monitored during pneumatic testing at each of the tested wells (Table A-4).

Dynamic rebound sample collection was performed as follows:

- Prior to initiating start-up at each SVE/DPE well, the Field Implementation Team conducted a shut-in test to verify that no leaks were present in the sampling equipment.
- The Field Implementation Team opened and adjusted the SVE/DPE well isolation valve to achieve the target flow rate that was near the historical flow rate for each well during routine OU1 SVE system operations.
- The Field Implementation Team collected the first soil gas sample approximately one hour after the dynamic test began in accordance with applicable Vapor Sample Collection SOP.
- After collecting the one-hour sample and at least an hour before collecting the 8-hour sample, the Field Implementation Team conducted a shut-in test to verify that no leaks were present in the sampling equipment.
- The Field Implementation Team collected the second soil gas sample approximately eight hours after the dynamic test began in accordance with applicable Vapor Sample Collection SOP.
- The samples were package and transported daily to the laboratory for analysis of VOCs using EPA Method TO-15 (Table A-2).

Pneumatic testing was performed as follows:

- The selected wells were tested in two groupings to maximize the applied vacuum within the flow constraints of the OU1 SVE system.
- The Field Implementation Team opened the isolation valve on the manifold to the 100 percent open position and adjusted the dilution air valve/variable frequency drive on the OU1 SVE system to attain the maximum vacuum at the well head and then recorded vacuum and flow rate at 5-minute intervals for the first 15 minutes and then at 15-minute intervals for the remaining 45 minutes of the pneumatic test.
- Approximately one hour after the isolation valve was opened, the Field Implementation Team closed the valve on the well and the pneumatic test at this well was complete.

2.4.3 Rebound Testing Results

The number and location of vapor samples collected during the OU1 DCP rebound testing is illustrated in Figure A-2. The results for static and dynamic rebound samples collected at respective sample locations have been compiled (Table A-5).

2.5 Membrane-Interface Probe

Membrane-Interface Probe (MIP) is a direct push tool that produces real-time, continuous, soil conductivity and qualitative organic vapor monitor profiling. MIP profile information was used to evaluate the relative change in MIP measurements due to operation of the OU1 OSS remedy by comparing pre-mitigation MIP profiles obtained during the RI at the Site with MIP profiles obtained during OU1 DCP implementation.

Based on results from the OU1 RI, the photoionization detector (PID) generally detected double-bonded compounds from 1 to 20,000 parts per million (ppm), the electron capture detector (ECD) detected halogenated compounds from 0.25 to 10 ppm, and the flame ionization detector detected combustible hydrocarbons from 1 to 100,000 ppm. The ECD, PID and soil conductivity were measured during MIP implementation.

Five MIP locations (Figure A-3) were selected based on a review of the RI MIP profiles. MIP borings were advanced to approximately 90 feet, the approximate thickness of the unsaturated zone, or the limits of the equipment, whichever was less. The MIP profiles are presented in Attachment 1.

The MIP profiles were reviewed prior to soil sample collection at each planned adjacent soil boring to design the soil sample intervals based on the MIP profile date. After the MIP profiles were obtained by the Field Implementation Team, soil borings adjacent to each MIP location were drilled to collect PID measurements, collect and analyze soil matrix samples and to obtain lithologic information (Section 2.6).

The MIP borings were backfilled a using a cement-bentonite mixture. The cement was installed using a tremie pipe in the MIP borehole from the bottom to approximately 1.5 feet below ground surface (bgs). The surface was patched using concrete.

2.6 Soil Borings

Eleven soil borings were advanced early in the OU1 DCP based on access considerations (Table A-1; Figure A-4). Ten of the soil borings (all but SB-2104) were located in areas that had relatively higher concentrations of VOCs based on pre-mitigation shallow and deep soil samples collected during the RI, with the objective of assessing current conditions in the areas that previously contained relatively higher VOC mass and which could potentially affect remedial effort, optimization, and performance. The remaining soil boring, SB-2104, was located adjacent to previous MIP location MIP-2102, to provide quantitative soil sample laboratory analytical data for comparison to the adjacent MIP qualitative data.

To assess reduction in VOCs in soil, soil samples were collected for analysis of VOCs routinely monitored as part of the OU1 SVE system and the GCR using EPA Method 5035/8260 (Tables A-2 and A-6). Soil samples were collected at five-foot depth intervals from 5 feet bgs to the total depth of each soil boring for field screening using a PID, lithologic logging and potential VOC analysis. The selection of which soil samples within the unsaturated zone (land surface to 90 feet) were analyzed for VOCs was determined as follows:

- For each ten-foot increment (for example, 5- & 10-foot sample; 15- & 20-foot sample, etc.), the soil sample that had the maximum PID field screening measurement was selected for VOC analysis unless the soil boring was adjacent to a MIP location; and,
- For soil borings adjacent to a MIP location, samples within the 10-foot intervals were adjusted to coincide with PID/ECD peaks based on the MIP profile. The MIP profiles were reviewed prior to advancing soil borings to select the adjusted sample depths, if applicable.

The following three analyses were also performed on selected soil samples: total organic carbon (TOC); moisture content; and resistivity. TOC and moisture were analyzed using the Walkley Black and ASTM D2216 methods, respectively (Tables A-2 and A-6), to evaluate potential constraints on OU1 SVE system optimization. Soil samples collected for TOC and moisture content from within the unsaturated zone were collected at 10-foot intervals from approximately 10 to 90 feet bgs. Resistivity was analyzed to allow for potential future evaluation of focused thermal SVE enhancement, to the extent there were high residual concentrations/mass detected. Portions of the soil cores collected for resistivity analysis from the soil borings were shipped to a laboratory, where composited samples from the same depth interval from multiple soil borings prior to conducting a box method in accordance with ASTM G187.

2.6.1 Procedures

Soil sampling, field PID screening, lithologic logging, and selection of soil samples for laboratory analyses were conducted using the following procedures:

- During soil sample collection, the Field Implementation Team:
  - Collected soil samples at 5-foot intervals from 5-feet to 90-feet and continuously from greater than 90-foot to the total depth for deeper soil borings.
    - The 5-foot soil samples were collected using a hand driven soil sampler.
    - The deeper soil samples were collected using a California modified split split-spoon sampler, so that soil samples collected from 10- to 90-feet did not have sample sleeves inside of the sampler.
  - A portion of soil cores collected from each 5-foot interval between 5-feet and 90-foot bgs were placed in sealed plastic Ziploc bags with head space for field screening using a calibrated PID. The bag was allowed to sit for approximately 15 minutes, at which time the head space of the bag was screened using the PID and recorded on the lithologic log.

  - o Lithologic logs were prepared using a portion of the core sample from each 5-foot interval.
  - o VOC subsamples were collected from each of the soil core samples as follows:
    - ▪ The core samples collected for VOC analysis (Table A-6) were subsampled immediately upon retrieval in accordance with USEPA Method 5035 using a Terra Core® sampling device and appropriate sample containers (Table A-2). The samples were placed on ice and transported to the laboratory at the end of each day.
  - o Samples collected at 10-foot intervals between 10 feet bgs and 90 feet bgs for TOC and moisture content analyses were obtained by removing soil from the core sampler and placing the soil into appropriate sample containers (Table A-2). TOC also was analyzed in the 95-foot and 105-foot samples collected from the two deeper soil borings. These samples were placed on ice and transmitted to the laboratory at the end of each day.
  - o Samples collected at 10-foot sample intervals between 15 and 85 feet bgs for electrical resistivity analysis were obtained by removing soil from the core sampler and placing the soil into appropriate sample containers (Table A-2).
- Following drilling, the boreholes were either backfilled using a cement-bentonite mixture, or were converted to VMP or SVE wells. The soil borings completed as VMPs or SVE wells have been identified in Table A-7 and Figure A-4.

All downhole drilling equipment was decontaminated and maintained in a clean condition prior to initiating drilling operations at each borehole location. All materials generated during drilling activities were temporarily stored on-Site in drums and/or roll off bins until the wastes were characterized and disposed as outlined in Section 2.8.

2.6.2 Soil Sample Results

Lithologic logs were compiled for each of the eleven soil borings (Attachment 2). The lithologic logs also include completion information for soil borings completed as SVE wells or VMPs. The results for VOCs detected in soil samples have been compiled (Table A-8). The results for TOC and moisture content in soil samples have been compiled (Table A-9). The results for soil resistivity composite samples are presented in Attachment 3.

2.7 Investigation-Derived Wastes

Investigation-derived waste generated during this data collection program included personal protective equipment, debris, soils from drilling events, and decontamination fluids from sampling and test events. All water wastes were treated directly by the on-site treatment system. IDW profiles were completed for the applicable soil, and the soil was appropriately disposed off-Site. The IDW was managed in accordance with the OU1 Remedial Design/Remedial Action SAP (CDM, 2010b), which is reiterated in the following.

Used gloves, tyvek suits, respirator cartridges, disposable filters, and other miscellaneous items were double-bagged using plastic trash bags and then disposed as solid waste. Items such as empty cement bags, wrapping materials, and used plastic sheeting were placed directly into solid waste dumpsters. Soil from drilling activities were placed into drums for off-Site disposal. The drums were inventoried and labeled to indicate the origin (borehole or well number) of the drum contents. All hazardous substances were disposed at an off-Site facility in accordance with USEPA's Off-Site Rule. The Field Implementation Team coordinated disposal with a IDW contractor under direct contracted to the client.

2.8 Quality Assurance

QA during field activities described in this document were accomplished by following the relevant SOPs (described in above sections and Section 1.2). Validation of soil gas samples was conducted by de maximis Data Management Solutions (ddms) as follows: approximately ten percent of samples received Stage 4 Validation/Verification and the remaining 90 percent of samples received Stage 2B Validation/Verification (ddms, 2021).

2.8.1 Quality Assurance Objectives for Measurement Data

QA procedures for collecting field measurement data were performed in accordance with the SOPs outlined in this section and Section 1.2.

2.8.2 Field Quality Assurance Samples

QA samples were collected and prepared to assist in determining data reliability. This section addresses Field QA samples associated with soil and soil gas. The methods and procedures for indoor air samples are specified in a separate document (de maximis, 2020). Field QA samples included field duplicates and trip blanks. QA samples were collected concurrent with and using the same procedures as the collection of the corresponding original soil or soil gas samples.

A field duplicate is a soil gas or soil sample collected as close as possible to the original sample time from the same source and is used to evaluate sampling precision. Field duplicates were labeled and packaged in the same manner as original samples so that the laboratory could not distinguish between original samples and duplicates. Field duplicates were collected as follows:

- for vapor samples, concurrent filling of original sample and duplicate sample containers at the location being monitored.
- for soil, collecting original and duplicate samples from the core sample as close to each other as practical.

Each duplicate sample was handled using the same sampling and preservation methods as the original samples. Field duplicates were collected at a frequency of 10 percent, or 1 for every 10 soil gas or soil samples. Duplicate samples were analyzed for the same constituents as the corresponding original samples.

One trip blank sample was submitted with each soil and groundwater shipment to the analytical laboratory that was analyzed for VOCs. Trip blanks were prepared by the analytical laboratory using reagent-free deionized water. The purpose of the trip blank is to identify possible contamination associated with container preparation and sample transport.

2.8.3 Laboratory Quality Control Samples

Laboratory QC samples were prepared and analyzed by the laboratory and included matrix spike (MS) / matrix spike duplicate (MSD) analyses.

3.0 REFERENCES

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TABLES

Table A-1. Data Collection Schedule

Test Type	Locations / Scope	Month Conducted[1]					
		2021				2022	
		Aug	Sep	Oct	Nov	Jan	Feb
Indoor Air Samples	All OU1 occupied buildings.			X		X	
Static Rebound Test	Select soil vapor extraction (SVE) Wells and Vapor Monitoring Points (VMPs)/ Soil gas samples for volatile organic compound (VOC) analysis.	X	X			X	X
Dynamic Rebound Test	SVE wells with significant rebound / Soil gas samples for VOC analysis (2 each at each testing location)				X		
	Pneumatic flow test for last hour at subset of dynamic test wells.				X		
Membrane Interface Probes (MIP)	Near selected Remedial Investigation MIP locations / were co-located with some of the soil borings below	X	X				
Soil Borings	Soil borings	X	X				
	Collect soil gas samples from VMPs installed in two soil borings			X			

[1] In several instances, one or two samples were collected in following month. For the purposes of this table, the month listed is limited to single month were vast majority of field activities were completed.

Table A-2. Summary of Analytical Methods and Handling Protocols

Matrix	Analyte	Method	Sample Container	Other Requirements	Preservation Method	Maximum Holding Time
Soil	Volatile Organic Compounds	EPA 5035 Terra Core Sampler	3 x 40 ml Volatile Organic Analysis Vials, Teflon Lined Septum	Approximately 5 grams of soil added to three 40 ml vials (one preservered with Methanol; two with sodium bisulfate)	Cool to 4ºC	14 Days
	Total Organic Carbon	Walkley Black	8 oz Glass Jar		Cool to 4ºC	28 Days
	Moisture Content	ASTM D2216	4 oz Glass Jar with Teflon Lid		Cool to 4ºC	10 Days
	Resistivity	ASTM G187	2 X 4 oz Glass Jar with Teflon Lid	Filled and packed to minimize moisture loss, lab will composite 8 samples from 11 soil borings. Composite sample will be tested at ambient soil moisture (no water added).	Keep Out of Sunlight	24 Hours[1]
Soil Gas	VOCs	EPA TO-15	1 L Summa	Particulate Matter Filter, Stainless Steel, In-line, 2 um	Keep Out of Sunlight	30 Days

[1]= Soil samples were stored within 24 hours of sample collection to minimize moisture loss and shipped in bulk to laboratory.

ºC Degrees Celsius
oz Ounce
L Liter
ml milliliters

Table A-3: Soil Gas Samples

Location ID	Depth	Month 1	Month 2	Month 3				Month 6
		Static Sample	Static Sample	Static Sample	Dynamic Test		Pneumatic Test	Static Sample
					1-hour	8-hour		
DPE-3	Deep	X	X		X	X		X
DPE-4	Deep	X	X		X	X	X	X
DPE-5	Deep	X	X					X
DPE-8	Deep	X	X		X	X	X	X
DPE-9	Deep	X	X		X	X		X
VE-1S	Shallow	X	X					
VE-2D	Deep	X	X		X	X	X	X
VE-5S	Shallow	X	X		X	X		X
VE-6D	Deep	X	X					X
VE-6S	Shallow	X	X					X
VE-7D	Deep	X	X					X
VE-8S	Shallow	X	X		X	X	X	X
VE-9S	Shallow	X	X				X	X
VE-10D	Deep	X	X		X	X		X
VE-10S	Shallow	X	X		X	X	X	X
VE-11S	Shallow	X	X					
VE-12S	Shallow	X	X					X
VE-14D	Deep	X						X
VE-14S	Shallow	X	X					X
VE-15S	Shallow	X	X					X
VE-21S	Shallow	X	X					X
VE-31S	Shallow	X	X					
VE-34S	Shallow	X	X					X
VE-39S	Shallow	X	X					
VMP-11-30	Shallow		X					X
VMP-12-30	Shallow		X					
VMP-15-30	Shallow		X					
VMP-16-30	Shallow		X					X
VMP-17-30	Shallow		X					
VMP-18-30	Shallow		X					X
VMP-20-30	Shallow		X					
VMP-21-30	Shallow		X					
VMP-22-30	Shallow		X					X
VMP-23-30	Shallow		X					X
VMP-24-30	Shallow		X					X
VMP-25-30	Shallow		X					
VMP-26-30	Shallow		X					X
VMP-27-30	Shallow		X					
VMP-31-24	Shallow		X					
VMP-31-70	Deep							
VMP-32-12	Shallow		X					
VMP-32-24	Shallow		X					
VMP-32-60	Deep		X					
VMP-43-24	Shallow		X					X
VMP-93-60	Deep		X					

Table A-3: Soil Gas Samples

Location ID	Depth	Month 1	Month 2	Month 3				Month 6
		Static Sample	Static Sample	Static Sample	Dynamic Test 1-hour	Dynamic Test 8-hour	Pneumatic Test	Static Sample
VMP-94-24	Shallow		X					
VMP-94-60	Deep		X					X
VMP-95-60	Deep		X					X
VMP-117-6	Shallow			X				
VMP-117-12	Shallow							
VMP-117-24	Shallow							
VMP-117-40	Deep			X				
VMP-117-50	Deep			X				
VMP-117-60	Deep							
VMP-117-70	Deep							
VMP-117-80	Deep							
VMP-118-6	Shallow			X				
VMP-118-12	Shallow			X				
VMP-118-24	Shallow			X				
VMP-118-40	Deep			X				
VMP-118-50	Deep			X				
VMP-118-60	Deep			X				
VMP-118-70	Deep			X				
VMP-118-80	Deep			X				

Notes:
Sample locations from VMP-117 were attempted, those with high vacuum were not sampled.

Table A-4 Pneumatic Test Results

Well ID	Time	Well Manifold Valve Opening (%)	Test Group[1]	Flow (scfm)	Vacuum (in H2O)	Dilution Valve Opening (%)
VE-8S	9:24	100	A	131	71	10
VE-8S	9:37	100	A	163	111	0
VE-8S	9:42	100	A	166	110	0
VE-8S	9:47	100	A	164	110	0
VE-8S	10:02	100	A	161	109	0
VE-8S	10:17	100	A	174	106	0
VE-8S	10:32	100	A	192	108	0
VE-8S	10:47	100	A	110	41	0
DPE-4	9:26	16.7	A	131	35	10
DPE-4	9:40	100	A	340	106	0
DPE-4	9:45	100	A	376	111	0
DPE-4	9:50	100	A	304	107	0
DPE-4	10:05	100	A	287	107	0
DPE-4	10:20	100	A	290	106	0
DPE-4	10:35	100	A	293	105	0
DPE-4	10:50	100	A	141	40	0
DPE-8	9:29	16.7	A	121	51	10
DPE-8	9:42	100	A	208	110	0
DPE-8	9:47	100	A	204	108	0
DPE-8	9:52	100	A	198	108	0
DPE-8	10:07	100	A	200	107	0
DPE-8	10:22	100	A	204	106	0
DPE-8	10:37	100	A	211	107	0
DPE-8	10:52	100	A	108	40	0
VE-2D	10:53	100	B	173	107	20
VE-2D	10:58	100	B	128	107	20
VE-2D	11:03	100	B	129	107	20
VE-2D	11:08	100	B	130	107	20
VE-2D	11:15	100	B	96	62	30
VE-2D	11:20	100	B	94	62	30
VE-2D	11:25	100	B	90	62	30
VE-2D	11:30	100	B	89	62	30
VE-2D	11:45	100	B	105	63	30
VE-2D	12:00	100	B	96	63	30
VE-2D	12:15	100	B	98	62	30
VE-9S	10:54	100	B	NM	107	20
VE-9S	10:59	100	B	NM	108	20
VE-9S	11:04	100	B	NM	108	20
VE-9S	11:09	100	B	NM	107	20
VE-9S	11:17	100	B	NM	63	30
VE-9S	11:22	100	B	NM	63	30

Table A-4 Pneumatic Test Results

Well ID	Time	Well Manifold Valve Opening (%)	Test Group[1]	Flow (scfm)	Vacuum (in H2O)	Dilution Valve Opening (%)
VE-9S	11:27	100	B	NM	63	30
VE-9S	11:32	100	B	NM	63	30
VE-9S	11:47	100	B	NM	63	30
VE-9S	12:02	100	B	NM	62	30
VE-9S	12:17	100	B	NM	62	30
VE-10S	10:55	100	B	65	108	20
VE-10S	11:00	100	B	73	108	20
VE-10S	11:05	100	B	75	108	20
VE-10S	11:10	100	B	76	108	20
VE-10S	11:18	100	B	51	63	30
VE-10S	11:23	100	B	56	63	30
VE-10S	11:28	100	B	54	63	30
VE-10S	11:33	100	B	52	63	30
VE-10S	11:48	100	B	55	63	30
VE-10S	12:03	100	B	58	63	30
VE-10S	12:18	100	B	57	63	30

Notes:

in H2O = inches of water

NM = not measured; entrained moisture present in the vapor stream prevented accurate flow measurement.

scfm = standard cubic feet per minute

1. Two groups of tests were conducted on November 11, 2021 (A and B), each with three wells included.

Table A-5. Detected Volatile Organic Compounds in Rebound Soil Gas Samples

Sample Location	Sample Date	Test	Modifier	Soil Depth Interval	1,1,1-Trichloroethane (TCA)	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,4-Dioxane	Benzene	Carbon disulfide	Chloroform	Freon 11	Freon 113	Hexane (N-Hexane)	Isopropyl Alcohol (Isopropanol)	Methyl ethyl ketone	Methylene chloride	o-Xylene	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)
DPE-3	8/23/2021	1-Month Static Rebound	N	Deep	110	<30	72	<30	160	<23	<92	<36	260	12000	<26	<72	87JN	<260	<32	2400	<28	76
DPE-3	9/22/2021	2-Month Static Rebound	N	Deep	120	<55	240J,N	<55	<200	<43	<170	<66	540	38000	<48	<130	310J,N	<470	<59	3400	<51	92J
DPE-3	11/18/2021	3-Month Dynamic Rebound, 1 Hour	N	Deep	140	<6.6	40	<6.6	<23	<5.2	<20	<8.0	28	600	<5.7	<16	<19	220	<7.1	3200	<6.1	61
DPE-3	11/18/2021	3-Month Dynamic Rebound, 8 Hour	N	Deep	140	<8.2	34	<8.2	<29	<6.5	<25	<9.9	21	440	<7.2	<20	<24	200	<8.8	3500	<7.6	62
DPE-3	1/10/2022	6-Month Static Rebound	N	Deep	59	<3.8	28	<3.8	<14	<3.0	<12	6.2	120	5200	<3.3	170	<11	49	<4.1	1300	5.5	29
DPE-4	8/24/2021	1-Month Static Rebound	N	Deep	<77	<57	210	<57	<200	<45	<180	<69	430	29000	<50	<140	<170	<490	<61	2900	<53	170
DPE-4	9/23/2021	2-Month Static Rebound	N	Deep	<38	<28	120J,N	<28	<99	<22	<86	<34	220	15000	<24	<68	<81	<240	<30	1700	<26	110J
DPE-4	11/18/2021	3-Month Dynamic Rebound, 1 Hour	N	Deep	<12	<9.3	47	<9.3	<33	<7.3	<28	<11	110	4200	<8.1	24	<27	<80	<10	1000	<8.6	93
DPE-4	11/18/2021	3-Month Dynamic Rebound, 8 Hour	N	Deep	<5.2	<3.8	20	<3.8	<14	<3.0	<12	4.8	49	960	<3.3	<9.3	<11	<33	<4.1	540	<3.6	62
DPE-4	1/10/2022	6-Month Static Rebound	FD	Deep	<28	<21	160J	<21	<74	<16	<64	<25	350J	25000J	<18	460J	<61	<180	<22	3500J	46J	180J
DPE-4	1/10/2022	6-Month Static Rebound	N	Deep	<37	<28	290	<28	<99	<22	<85	34	620	42000	<24	440	<81	<240	<30	6000	76	310
DPE-4	1/21/2022	6-Month Static Rebound	FD	Deep	56	<17	650	<17	<62	<14	<53	75	1400	77000	<15	<42	<51	<150	<19	9200	<16	660
DPE-4	1/21/2022	6-Month Static Rebound	N	Deep	53	<17	740	<17	<60	<13	<52	78	1600	87000	<15	<41	<50	<140	<18	2000	<16	460
DPE-5	8/23/2021	1-Month Static Rebound	N	Deep	<5.6	<4.2	<4.1	<4.2	<15	<3.3	<13	<5.0	6.1	21	<3.6	<10	40JN	<36	4.6	89	<3.9	<5.5
DPE-5	9/22/2021	2-Month Static Rebound	N	Deep	<5.2	<3.8	24J	<3.8	<14	<3.0	<12	5.6	19	75	<3.3	<9.3	39J,N	<33	4.1	290	<3.6	12J
DPE-5	1/10/2022	6-Month Static Rebound	N	Deep	<14	<10	2000	<10	<37	<8.3	<32	31	1400	5400	<9.1	<26	52	<90	12	5600	<9.8	380
DPE-8	8/24/2021	1-Month Static Rebound	N	Deep	<6.0	<4.5	41	<4.5	<16	<3.5	<14	15	660	1500	<3.9	<11	27JN	<38	5	2400	<4.2	300
DPE-8	9/23/2021	2-Month Static Rebound	N	Deep	8.6	<4.0	42J	<4.0	<14	<3.2	<12	19	510	1100	<3.5	11J	22J,N	50	<4.3	2200	<3.8	290J
DPE-8	11/18/2021	3-Month Dynamic Rebound, 1 Hour	FD	Deep	12	<4.1	21	<4.1	<15	<3.2	<13	19	22	49	<3.6	13	<12	200	-99999R	270	<3.8	26
DPE-8	11/18/2021	3-Month Dynamic Rebound, 1 Hour	N	Deep	12	<4.0	18	<4.0	<14	5J	<12	18	20	44	<3.4	20	<12	180	-99999R	250	31J	24
DPE-8	11/18/2021	3-Month Dynamic Rebound, 8 Hour	N	Deep	10	<4.1	17	<4.1	<14	<3.2	<12	18	15	78	<3.6	47	<12	160	<4.4	250	<3.8	22
DPE-8	1/10/2022	6-Month Static Rebound	N	Deep	16	<4.0	34	<4.0	<14	<3.2	<12	24	270	720	<3.5	<9.8	<12	46	<4.3	2000	<3.7	170
DPE-9	8/23/2021	1-Month Static Rebound	N	Deep	<12	<8.7	260	<8.7	<31	<6.9	<27	37	550	3900	<7.6	<21	78JN	<75	<9.4	1900	<8.1	110
DPE-9	9/22/2021	2-Month Static Rebound	FD	Deep	<29	<22	1000	<22	<77	<17	<67	49	1800	9200	<19	<52	220J,N	<180	<23	3200	<20	180
DPE-9	9/22/2021	2-Month Static Rebound	N	Deep	<29	<21	1000	<21	<76	<17	<65	46	1700	8900	<18	<52	210J,N	<180	<23	3200	<20	180
DPE-9	11/18/2021	3-Month Dynamic Rebound, 1 Hour	N	Deep	<5.6	<4.2	52	<4.2	<15	<3.3	<13	11	88	580	<3.6	65	<12	<36	<4.5	400	<3.9	29
DPE-9	11/18/2021	3-Month Dynamic Rebound, 8 Hour	N	Deep	<5.7	<4.2	33	<4.2	<15	<3.3	<13	8.6	37	170	<3.7	18	<12	<36	<4.5	270	<3.9	23
DPE-9	1/10/2022	6-Month Static Rebound	N	Deep	<5.4	<4.0	370	<4.0	<14	<3.2	<12	20	520	3800	<3.5	23	<12	<35	<4.3	1700	<3.8	86
VE-10D	8/25/2021	1-Month Static Rebound	N	Deep	<6.2	<4.6	160	<4.6	<16	<3.6	<14	24	320	2000	<4.0	<11	18JN	<39	<4.9	1500	<4.3	570
VE-10D	9/24/2021	2-Month Static Rebound	N	Deep	<5.7	<4.2	140	<4.2	<15	<3.3	<13	27	200	1300	<3.7	11	36J,N	<36	<4.5	1300	<3.9	500
VE-10D	11/17/2021	3-Month Dynamic Rebound. 1 hour	N	Deep	<5.4	<4.0	100	<4.0	<14	<3.2	<12	27	120	700	<3.5	11	<12	<35	<4.3	1200	<3.8	310
VE-10D	11/17/2021	3-Month Dynamic Rebound, 8 Hour	N	Deep	<5.8	<4.3	94	<4.3	<15	<3.4	<13	27	99	560	<3.7	12	<12	<37	<4.6	1200	<4.0	320
VE-10D	1/11/2022	6-Month Static Rebound	N	Deep	<22	<16	1100	<16	<58	<13	<50	88	2000	21000	<14	<39	<47	<140	<17	5200	<15	520
VE-10S	8/24/2021	1-Month Static Rebound	N	Shallow	<5.6	<4.1	9.2	<4.1	<15	<3.2	<13	<5.0	5.7	13	<3.6	<10	55JN	<35	<4.4	300	<3.8	14
VE-10S	9/23/2021	2-Month Static Rebound	N	Shallow	<5.5	<4.1	12J,N	<4.1	<14	<3.2	<12	<4.9	6.1	25	<3.6	34J	220J,N	<35	<4.4	280	<3.8	14J
VE-10S	11/18/2021	3-Month Dynamic Rebound, 1 Hour	N	Shallow	<5.4	<4.0	21	<4.0	<14	<3.2	<12	<4.8	13	28	<3.5	13	<12	<34	<4.3	250	<3.7	22
VE-10S	11/18/2021	3-Month Dynamic Rebound, 8 Hour	FD	Shallow	<5.6	<4.1	28	<4.1	<15	<3.2	<13	<5.0	15	40	<3.6	21	<12	<35	17J	420	<3.8	30
VE-10S	11/18/2021	3-Month Dynamic Rebound, 8 Hour	N	Shallow	<5.6	<4.2	26	<4.2	<15	<3.3	<13	<5.0	15	38	<3.6	30	<12	<36	<4.5	440	<3.9	29
VE-10S	1/10/2022	6-Month Static Rebound	N	Shallow	<58	<43	<42	<43	<150	<34	170	<52	<60	<82	<38	<100	4500	<370	<46	560	<40	<58
VE-11S	8/24/2021	1-Month Static Rebound	FD	Shallow	<5.7	<4.2	<4.2	<4.2	<15	<3.4	<13	<5.1	<5.9	<8.0	<3.7	22	66JN	<36	<4.6	38	<4.0	<5.6
VE-11S	8/24/2021	1-Month Static Rebound	N	Shallow	<5.7	<4.2	<4.1	<4.2	<15	<3.3	<13	<5.1	<5.8	<8.0	<3.7	14	66JN	<36	<4.5	40	<3.9	<5.6
VE-11S	9/23/2021	2-Month Static Rebound	N	Shallow	<5.6	<4.2	<4.1	<4.2	<15	<3.3	<13	<5.0	<5.8	9	<3.6	12J	110J,N	<36	<4.5	45	<3.9	<5.5
VE-12S	8/23/2021	1-Month Static Rebound	N	Shallow	<5.7	<4.2	4.2	<4.2	<15	<3.3	<13	<5.1	8.1	21	<3.7	<10	28JN	<36	<4.5	74	<3.9	<5.6
VE-12S	9/22/2021	2-Month Static Rebound	N	Shallow	<6.4	<4.7	6.8J	<4.7	<17	<3.7	<14	<5.7	11	30	<4.1	18J	76J,N	<41	<5.1	100	<4.4	<6.3
VE-12S	1/10/2022	6-Month Static Rebound	N	Shallow	<5.3	<3.9	22	<3.9	<14	<3.1	<12	<4.7	29	120	<3.4	<9.5	<11	<34	<4.2	150	<3.6	<5.2
VE-14D	8/23/2021	1-Month Static Rebound	N	Deep	<6.0	<4.5	5.3	<4.5	<16	<3.5	<14	<5.4	13	56	<3.9	<11	96JN	<38	<4.8	200	<4.2	28

Table A-5. Detected Volatile Organic Compounds in Rebound Soil Gas Samples

Sample Location	Sample Date	Test	Modifier	Soil Depth Interval	1,1,1-Trichloroethane (TCA)	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,4-Dioxane	Benzene	Carbon disulfide	Chloroform	Freon 11	Freon 113	Hexane (N-Hexane)	Isopropyl Alcohol (Isopropanol)	Methyl ethyl ketone	Methylene chloride	o-Xylene	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)
VE-14D	9/22/2021	2-Month Static Rebound	FD	Deep	<6.0	<4.5	11J	<4.5	<16	<3.5	<14	<5.4	16	73	<3.9	17J	42J,N	<38	<4.8	-99999R	<4.2	46J
VE-14D	9/22/2021	2-Month Static Rebound	N	Deep	<6.0	<4.5	<4.4	<4.5	<16	<3.5	<14	<5.4	15	78	<3.9	39J	<13	<38	<4.8	-99999R	<4.2	<6.0
VE-14D	1/10/2022	6-Month Static Rebound	N	Deep	<5.6	<4.1	16	<4.1	<15	<3.2	<13	<5.0	24	97	<3.6	<10	22	<35	<4.4	280	<3.8	39
VE-14S	8/24/2021	1-Month Static Rebound	N	Shallow	<5.9	<4.4	7.2	<4.4	<15	<3.4	<13	<5.2	72	1000	<3.8	<10	20JN	<37	<4.7	320	<4.0	13
VE-14S	9/23/2021	2-Month Static Rebound	N	Shallow	<5.3	<4.0	<3.9	<4.0	<14	<3.1	<12	<4.8	30	320	<3.4	10J	<12	<34	<4.2	140	<3.7	5.8J
VE-14S	1/10/2022	6-Month Static Rebound	N	Shallow	<5.2	<3.9	<3.8	<3.9	<14	<3.1	<12	<4.7	30	100	<3.4	14	<11	<33	<4.2	18	<3.6	<5.2
VE-15S	8/23/2021	1-Month Static Rebound	N	Shallow	<5.6	<4.2	<4.1	<4.2	<15	<3.3	<13	<5.0	15	24	<3.6	<10	81JN	<36	<4.5	88	<3.9	7.3
VE-15S	9/22/2021	2-Month Static Rebound	N	Shallow	<5.6	<4.2	<4.1	<4.2	<15	<3.3	<13	<5.0	21	40	<3.6	10J	150J,N	<36	<4.5	84	<3.9	11J
VE-15S	1/10/2022	6-Month Static Rebound	N	Shallow	<4.6	<3.4	<3.3	<3.4	<12	<2.7	<10	<4.1	84J	140J	<2.9	<8.2	20J	<29	<3.6	100J	<3.1	23J
VE-15S	1/21/2022	6-Month Static Rebound	N	Shallow	<5.4	<4.0	6.3	<4.0	<14	<3.2	<12	<4.9	94	160	<3.5	<9.8	<12	<35	<4.3	110	<3.8	26
VE-1S	8/23/2021	1-Month Static Rebound	N	Shallow	7.6	<4.0	<3.9	<4.0	<14	<3.2	<12	<4.8	<5.6	9.6	<3.5	18	42JN	<34	<4.3	72	<3.7	<5.3
VE-1S	9/22/2021	2-Month Static Rebound	N	Shallow	12	<4.5	<4.4	<4.5	<16	<3.5	<14	<5.4	7	18	<3.9	13J	170J,N	<38	<4.8	87	<4.2	<6.0
VE-21S	8/25/2021	1-Month Static Rebound	N	Shallow	<5.7	<4.2	<4.1	<4.2	<15	<3.3	<13	<5.1	<5.9	8	<3.7	11	<12	<36	<4.5	<7.1	<3.9	<5.6
VE-21S	9/23/2021	2-Month Static Rebound	N	Shallow	<5.6	<4.2	<4.1	<4.2	<15	<3.3	<13	<5.0	6	15	<3.6	11J	82J,N	<36	<4.5	36	<3.9	<5.6
VE-21S	1/11/2022	6-Month Static Rebound	N	Shallow	<5.3	<3.9	4.2	<3.9	<14	<3.1	<12	<4.7	9.1	28	<3.4	<9.5	220	<34	<4.2	74	<3.6	<5.2
VE-2D	8/24/2021	1-Month Static Rebound	N	Deep	68	<4.4	9.2	<4.4	<16	<3.5	<14	9.5	59	680	<3.8	<11	<13	<38	<4.7	1000	<4.1	17
VE-2D	9/24/2021	2-Month Static Rebound	N	Deep	88	<4.1	13	<4.1	<15	<3.2	25	12	37	270	<3.6	10	<12	<35	<4.4	1000	<3.8	22
VE-2D	11/18/2021	3-Month Dynamic Rebound, 1 Hour	N	Deep	84	<4.1	32	<4.1	<15	<3.2	<13	11	47	150	<3.6	18	<12	80	<4.4	1200	<3.8	36
VE-2D	11/18/2021	3-Month Dynamic Rebound, 8 Hour	N	Deep	72	<4.2	32	<4.2	<15	<3.3	<13	11	42	180	<3.6	15	<12	81	<4.5	1100	<3.9	37
VE-2D	1/13/2022	6-Month Static Rebound	N	Deep	100	<4.1	33	<4.1	<14	<3.2	<12	19	50	630	<3.6	<9.9	<12	65	<4.4	1200	<3.8	41
VE-31S	8/25/2021	1-Month Static Rebound	N	Shallow	<6.0	<4.4	<4.4	<4.4	<16	<3.5	<14	<5.4	<6.2	<8.4	<3.9	<11	100JN	<38	<4.8	17	<4.1	<5.9
VE-31S	9/24/2021	2-Month Static Rebound	N	Shallow	<5.6	<4.1	<4.0	<4.1	<15	<3.2	<13	<5.0	7.6	24	<3.6	13	260J,N	<35	<4.4	51	<3.8	<5.5
VE-34S	8/25/2021	1-Month Static Rebound	N	Shallow	<6.1	<4.6	<4.5	<4.6	<16	<3.6	<14	<5.5	<6.3	<8.6	<4.0	22	310JN	<39	<4.9	<7.6	<4.2	<6.0
VE-34S	9/23/2021	2-Month Static Rebound	N	Shallow	<5.8	<4.3	<4.2	<4.3	<15	<3.4	<13	<5.2	6	36	<3.7	15J	200J,N	<37	<4.6	77	<4.0	<5.7
VE-34S	1/11/2022	6-Month Static Rebound	N	Shallow	<5.2	<3.9	<3.8	<3.9	<14	<3.1	<12	<4.7	9.5	40	<3.4	<9.4	340	<33	<4.2	120	<3.6	<5.2
VE-39S	8/25/2021	1-Month Static Rebound	N	Shallow	<5.8	<4.3	<4.2	<4.3	<15	<3.4	<13	<5.2	<6.0	<8.2	<3.8	18	40JN	<37	<4.6	12	<4.0	<5.7
VE-39S	9/23/2021	2-Month Static Rebound	N	Shallow	<6.0	<4.4	<4.3	<4.4	<16	<3.5	<14	<5.3	6.1J	29	<3.8	12J	48J,N	<38	<4.8	30	<4.1	<5.9
VE-5S	8/23/2021	1-Month Static Rebound	N	Shallow	<5.8	<4.3	<4.2	<4.3	<15	<3.4	<13	<5.2	13	120	<3.8	35	24JN	<37	<4.6	26	<4.0	7.1
VE-5S	9/22/2021	2-Month Static Rebound	N	Shallow	<6.1	<4.6	<4.5	<4.6	<16	<3.6	<14	<5.5	15	52	<4.0	16J	70J,N	<39	<4.9	410	<4.2	18J
VE-5S	11/18/2021	3-Month Dynamic Rebound, 1 Hour	N	Shallow	7.3	<4.2	7.2J,N	<4.2	18	<3.3	<13	<5.0	28	74	<3.6	12	<12	<36	<4.5	340	<3.9	17
VE-5S	11/18/2021	3-Month Dynamic Rebound, 8 Hour	N	Shallow	8.4	<3.9	5.6	<3.9	<14	3.8J	<12	<4.8	26	110	<3.4	24	120J,N	<34	<4.2	330	<3.7	16
VE-5S	1/10/2022	6-Month Static Rebound	N	Shallow	12	<3.9	5.3	<3.9	<14	<3.1	<12	<4.8	36	140	<3.4	<9.6	<12	<34	<4.2	430	<3.7	22
VE-6D	8/25/2021	1-Month Static Rebound	N	Deep	6	<4.3	9.6	<4.3	<15	<3.4	<13	<5.2	25	94	<3.8	<10	70JN	<37	<4.6	250	<4.0	8.3
VE-6D	9/24/2021	2-Month Static Rebound	N	Deep	7	<4.3	22J,N	<4.3	<15	<3.4	<13	<5.2	26	110	<3.7	13	36J,N	<37	<4.6	270	<4.0	11
VE-6D	1/11/2022	6-Month Static Rebound	FD	Deep	6.8	<3.8	80	<3.8	<14	<3.0	15	<4.6	35	140	<3.3	15	170J	<33	<4.1	290	<3.5	13
VE-6D	1/11/2022	6-Month Static Rebound	N	Deep	6.5	<3.8	69	<3.8	<13	<3.0	23	<4.5	32	130	<3.3	17	300J	<32	<4.0	260	<3.5	12
VE-6S	8/23/2021	1-Month Static Rebound	N	Shallow	<5.5	<4.1	9.2	<4.1	<15	<3.2	<13	<5.0	72	1000	<3.6	<10	16JN	<35	<4.4	390	<3.8	26
VE-6S	9/22/2021	2-Month Static Rebound	N	Shallow	<6.0	<4.4	<4.4	<4.4	<16	<3.5	<14	<5.4	26	270	<3.9	11J	97J,N	<38	<4.8	150	<4.1	<5.9
VE-6S	1/10/2022	6-Month Static Rebound	N	Shallow	<4.9	<3.6	<3.6	<3.6	<13	<2.9	<11	<4.4	23	87	<3.2	<8.8	<11	<31	<3.9	130	<3.4	16
VE-7D	8/25/2021	1-Month Static Rebound	N	Deep	<5.8	<4.3	91	<4.3	<15	<3.4	<13	<5.2	240	1500	<3.8	16	32JN	<37	<4.6	1500	<4.0	210
VE-7D	9/24/2021	2-Month Static Rebound	N	Deep	<5.4	<4.0	100	<4.0	<14	<3.2	<12	<4.9	180	1200	<3.5	16	97J,N	<35	<4.3	1300	<3.8	230
VE-7D	1/11/2022	6-Month Static Rebound	N	Deep	<60	<45	<44	<45	<160	<35	<140	<54	<62	110	<39	<110	4000	<380	<48	260	<42	<60
VE-8S	8/23/2021	1-Month Static Rebound	FD	Shallow	21	<4.0	<3.9	<4.0	<14	<3.2	<12	6.6	46	690	<3.5	20	92JN	<34	<4.3	800	<3.7	13
VE-8S	8/23/2021	1-Month Static Rebound	N	Shallow	22	<4.0	<3.9	<4.0	<14	<3.2	<12	7.3	48	690	<3.5	<9.8	99JN	<34	<4.3	810	<3.7	14
VE-8S	9/22/2021	2-Month Static Rebound	N	Shallow	35	<4.1	<4.1	<4.1	<15	<3.3	<13	8.7	16	470	<3.6	13J	24J,N	<36	<4.4	810	<3.9	12J
VE-8S	11/18/2021	3-Month Dynamic Rebound, 1 Hour	N	Shallow	95	<4.0	8.1J,N	<4.0	<14	4.4J	<12	8.3	14	1600	61	14	<12	<34	<4.2	960	<3.7	26

Table A-5. Detected Volatile Organic Compounds in Rebound Soil Gas Samples

Sample Location	Sample Date	Test	Modifier	Soil Depth Interval	1,1,1-Trichloroethane (TCA)	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,4-Dioxane	Benzene	Carbon disulfide	Chloroform	Freon 11	Freon 113	Hexane (N-Hexane)	Isopropyl Alcohol (Isopropanol)	Methyl ethyl ketone	Methylene chloride	o-Xylene	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)
VE-8S	11/18/2021	3-Month Dynamic Rebound, 8 Hour	N	Shallow	86	5.3	5.6J,N	<4.1	<15	<3.2	<13	<5.0	14	1100	<3.6	32	<12	<35	<4.4	1400	<3.8	50
VE-8S	1/10/2022	6-Month Static Rebound	N	Shallow	110	5.7	<3.8	<3.9	<14	<3.0	<12	12	14	1200	<3.4	<9.4	<11	<33	<4.1	1200	<3.6	60
VE-9S	8/23/2021	1-Month Static Rebound	FD	Shallow	<5.5	<4.1	<4.0	<4.1	<15	<3.2	<13	<5.0	10	38	<3.6	<10	69JN	<35	<4.4	1700	<3.8	12
VE-9S	8/23/2021	1-Month Static Rebound	N	Shallow	<5.5	<4.1	<4.0	<4.1	<15	<3.2	<13	<5.0	9.3	37	<3.6	26	68JN	<35	<4.4	1600	<3.8	13
VE-9S	9/22/2021	2-Month Static Rebound	N	Shallow	<5.8	<4.3	<4.2	<4.3	<15	<3.4	<13	<5.2	17	80	<3.7	<10	130J,N	<37	<4.6	1700	<4.0	20J
VE-9S	1/10/2022	6-Month Static Rebound	N	Shallow	16	<4.0	<3.9	<4.0	<14	<3.2	<12	<4.8	15	52	<3.5	26	<12	<34	<4.3	19	<3.7	8.2
VE-9S	2/4/2022	6-Month Static Rebound, Resample	N	Shallow	<5.2	<3.8	<3.8	<3.8	<14	<3.0	<12	<4.6	16	68	<3.3	19	<11	<33	<4.1	1300	<3.6	18
VE-9S	2/4/2022	6-Month Static Rebound, Resample	N	Shallow	<5.5	<4.1	<4.0	<4.1	<14	<3.2	180	<4.9	10	60	<3.6	30	<12	<35	<4.4	820	14	15
VMP-11-30	9/27/2021	2-Month Static Rebound	FD	Shallow	<5.5	<4.1	42	<4.1	<14	<3.2	<12	<4.9	7.4	14	<3.6	<9.9	<12	<35	<4.4	800	<3.8	49
VMP-11-30	9/27/2021	2-Month Static Rebound	N	Shallow	<5.5	<4.1	40	<4.1	<14	<3.2	<12	<4.9	7.3	13	<3.5	<9.9	<12	<35	<4.4	800	<3.8	48
VMP-11-30	1/13/2022	6-Month Static Rebound	N	Shallow	<5.5	<4.1	58	<4.1	<14	<3.2	<12	<4.9	23	47	<3.6	<9.9	<12	<35	<4.4	1000	<3.8	55
VMP-117-40	10/7/2021	Initial New VMP	N	Deep	<5.6	<4.2	22	<4.2	<15	94	<13	<5.0	8.4	10	<3.6	10	<12	49J	6.7	68J	25J	<5.5
VMP-117-50	10/7/2021	Initial New VMP	N	Deep	<6.0	<4.4	17	<4.4	<16	30	14	<5.3	6.8	9.2	<3.8	51	<13	65J	18	69J	63J	<5.9
VMP-117-6	10/7/2021	Initial New VMP	N	Shallow	<65	<48	90	<48	<170	460J,N	<150	<58	73	400	3200	<120	<140	<160	2400	6000J	1200J	200J,N
VMP-118-12	10/7/2021	Initial New VMP	N	Shallow	300J	<18	<17	<18	<62	68	<54	<21	31	5000	<15	<42	<51	<150	<19	1500J	36J	60
VMP-118-24	10/7/2021	Initial New VMP	N	Shallow	610J	<86	<84	<86	<300	100	<260	<100	<120	1200	<75	<210	<250	<740	<92	26000J	<80	200
VMP-118-40	10/7/2021	Initial New VMP	N	Deep	230J	<5.9	32	<5.9	<21	85	<18	12	14	140	12J,N	14	23J,N	280J	<6.4	2900J	40J	66
VMP-118-50	10/7/2021	Initial New VMP	FD	Deep	500J	<40	140	<40	<140	380	<120	<48	80	210	290J,N	<97	<120	880J	<43	2500J	210J	220
VMP-118-50	10/7/2021	Initial New VMP	N	Deep	340J	<40	120	<40	<140	320	<120	<48	75	160	260J,N	<98	260J,N	690J	<43	1600J	300J	130
VMP-118-6	10/7/2021	Initial New VMP	N	Shallow	460J	<10	<10	<10	<37	<8.2	<32	<12	34	5700	<9.0	<25	<30	<89	<11	590J	18J	56
VMP-118-60	10/7/2021	Initial New VMP	N	Deep	1200J	<20	140J,N	<20	<71	180	<62	<24	30	300	<17	<49	<58	500J	<22	8900J	61J	110
VMP-118-70	10/7/2021	Initial New VMP	N	Deep	74J	<4.3	60	11	<15	67	<13	35	86	260	26J,N	49	31J,N	430J	10	940J	54J	73
VMP-118-80	10/7/2021	Initial New VMP	N	Deep	17J	<6.1	46J,N	13	<22	75	<19	49	150	3200	10	20	30J,N	160J	<6.6	1100J	33J	67
VMP-12-30	9/27/2021	2-Month Static Rebound	N	Shallow	<5.6	<4.2	7.1	<4.2	<15	<3.3	<13	<5.0	<5.8	<7.9	<3.6	21	<12	<36	<4.5	62	<3.9	5.5J
VMP-15-30	9/27/2021	2-Month Static Rebound	N	Shallow	<5.9	<4.4	5.1	<4.4	<15	<3.4	<13	<5.2	<6.0	<8.2	<3.8	10J	<13	<37	<4.7	50	<4.0	<5.8
VMP-16-30	9/27/2021	2-Month Static Rebound	N	Shallow	<5.5	<4.1	<4.0	<4.1	<14	<3.2	18	<4.9	<5.6	12	<3.5	17	<12	<35	<4.4	110	<3.8	<5.4
VMP-16-30	1/13/2022	6-Month Static Rebound	FD	Shallow	<5.6	<4.2	<4.1	<4.2	<15	<3.3	<13	<5.0	6.2	12	<3.6	16	<12	<36	<4.5	100	<3.9	<5.6
VMP-16-30	1/13/2022	6-Month Static Rebound	N	Shallow	<5.6	<4.2	<4.1	<4.2	<15	<3.3	<13	<5.0	6.2	12	<3.6	17	<12	<36	6.4	100	6	<5.6
VMP-17-30	9/27/2021	2-Month Static Rebound	N	Shallow	<5.5	<4.1	<4.0	<4.1	<15	<3.2	<13	<5.0	<5.7	<7.8	<3.6	11	<12	<35	<4.4	21	<3.8	<5.4
VMP-18-30	9/28/2021	2-Month Static Rebound	FD	Shallow	<5.8	<4.3	5.5	<4.3	<15	<3.4	<13	<5.2	68	140	<3.8	10J	<12	<37	<4.6	320	<4.0	59
VMP-18-30	9/28/2021	2-Month Static Rebound	N	Shallow	<5.7	<4.2	4.9	<4.2	<15	<3.4	<13	<5.1	65	140	<3.7	26	<12	<36	<4.6	300	<4.0	54
VMP-18-30	1/13/2022	6-Month Static Rebound	N	Shallow	<5.6	<4.1	12	<4.1	<15	<3.2	<13	<5.0	140	240	<3.6	<10	<12	<35	<4.4	430	<3.8	66
VMP-20-30	9/23/2021	2-Month Static Rebound	N	Shallow	<5.5	<4.1	<4.0	<4.1	<14	<3.2	52	<4.9	11	15	<3.5	25J	<12	<35	<4.4	18	<3.8	<5.4
VMP-21-30	9/23/2021	2-Month Static Rebound	N	Shallow	<5.7	<4.2	9.5J	<4.2	<15	<3.4	<13	<5.1	28	35	<3.7	24J	<12	<36	<4.6	93	<4.0	15J
VMP-22-30	9/24/2021	2-Month Static Rebound	N	Shallow	<5.9	<4.4	<4.3	<4.4	<16	<3.5	<14	<5.3	13	19	<3.8	12	<13	<38	<4.7	170	<4.1	36
VMP-22-30	1/13/2022	6-Month Static Rebound	N	Shallow	7.4	<4.1	<4.0	<4.1	<14	<3.2	<12	<4.9	32	64	<3.6	16	<12	<35	<4.4	180	<3.8	41
VMP-23-30	9/28/2021	2-Month Static Rebound	N	Shallow	<5.6	<4.2	25	<4.2	<15	<3.3	<13	<5.0	14	43	<3.6	12	<12	<36	<4.5	290	<3.9	7.1
VMP-23-30	1/11/2022	6-Month Static Rebound	N	Shallow	<5.6	<4.2	110	<4.2	<15	<3.3	<13	<5.0	160	820	<3.6	<10	<12	<36	<4.5	410	<3.9	11
VMP-24-30	9/28/2021	2-Month Static Rebound	N	Shallow	<5.8	<4.3	29	<4.3	<15	<3.4	<13	<5.2	16	26	<3.8	18	<13	<37	<4.6	200	<4.0	14
VMP-24-30	1/11/2022	6-Month Static Rebound	N	Shallow	5.9	<4.3	62	<4.3	<15	<3.4	<13	<5.2	39	62	<3.7	11	<12	<37	<4.6	300	<4.0	19
VMP-25-30	9/28/2021	2-Month Static Rebound	N	Shallow	<5.5	<4.1	14	<4.1	<15	<3.2	<13	<5.0	8.9	41	<3.6	14	<12	<35	<4.4	72	<3.8	<5.4
VMP-26-30	9/23/2021	2-Month Static Rebound	N	Shallow	<5.8	<4.3	<4.2	<4.3	<15	<3.4	14	<5.2	12	36	<3.8	11J	<12	<37	<4.6	66	<4.0	8.6J

Table A-5. Detected Volatile Organic Compounds in Rebound Soil Gas Samples

Sample Location	Sample Date	Test	Modifier	Soil Depth Interval	1,1,1-Trichloroethane (TCA)	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,4-Dioxane	Benzene	Carbon disulfide	Chloroform	Freon 11	Freon 113	Hexane (N-Hexane)	Isopropyl Alcohol (Isopropanol)	Methyl ethyl ketone	Methylene chloride	o-Xylene	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)
VMP-26-30	1/11/2022	6-Month Static Rebound	N	Shallow	<5.0	<3.7	<3.6	<3.7	<13	<2.9	<11	<4.4	26	88	<3.2	<8.9	<11	<32	<4.0	47	<3.4	7
VMP-27-30	9/23/2021	2-Month Static Rebound	N	Shallow	<6.0	<4.4	<4.3	<4.4	<16	<3.5	18	<5.3	7.9	13	<3.8	21J	<13	<38	<4.8	<7.4	<4.1	<5.9
VMP-31-24	9/28/2021	2-Month Static Rebound	N	Shallow	<6.1	<4.6	6.3	<4.6	<16	<3.6	<14	<5.5	<6.3	13	<4.0	<11	<13	<39	<4.9	22	<4.2	<6.0
VMP-32-12	9/28/2021	2-Month Static Rebound	N	Shallow	<5.6	<4.1	<4.0	<4.1	<15	<3.2	<13	<5.0	<5.7	7.8	<3.6	18	<12	<35	<4.4	76	<3.8	<5.5
VMP-32-24	9/28/2021	2-Month Static Rebound	N	Shallow	<5.7	<4.2	<4.1	<4.2	<15	<3.3	<13	<5.1	<5.8	<8.0	<3.7	13	<12	<36	<4.5	52	<3.9	<5.6
VMP-32-60	9/28/2021	2-Month Static Rebound	N	Deep	<5.7	<4.2	<4.1	<4.2	<15	<3.3	<13	<5.1	<5.9	8.6	<3.7	16	<12	<36	<4.5	33	<3.9	<5.6
VMP-43-24	9/28/2021	2-Month Static Rebound	N	Shallow	<5.5	<4.1	<4.0	<4.1	<14	<3.2	<12	<4.9	<5.7	20	<3.6	17	<12	<35	<4.4	72	<3.8	18
VMP-43-24	1/11/2022	6-Month Static Rebound	N	Shallow	<5.4	<4.0	<3.9	<4.0	<14	<3.2	<12	<4.8	12	37	<3.5	<9.7	<12	<34	<4.3	140	<3.7	14
VMP-93-60	9/27/2021	2-Month Static Rebound	N	Deep	<5.6	<4.2	17	<4.2	<15	<3.3	<13	7.2	8.6	22	<3.6	13	<12	<36	<4.5	970	<3.9	21
VMP-94-24	9/28/2021	2-Month Static Rebound	N	Shallow	<5.4	<4.0	<4.0	<4.0	<14	<3.2	<12	<4.9	<5.6	13	<3.5	<9.8	<12	<35	<4.3	10	<3.8	<5.4
VMP-94-60	9/28/2021	2-Month Static Rebound	FD	Deep	<5.6	<4.2	7.2	<4.2	<15	<3.3	<13	<5.0	<5.8	12	<3.6	<10	<12	<36	<4.5	67	<3.9	7.2
VMP-94-60	9/28/2021	2-Month Static Rebound	N	Deep	<5.6	<4.1	6.6	<4.1	<15	<3.2	<13	<5.0	<5.7	11	<3.6	17	<12	<35	<4.4	65	<3.8	6.9
VMP-94-60	1/11/2022	6-Month Static Rebound	N	Deep	<5.9	<4.4	<4.3	<4.4	<16	<3.4	<13	<5.3	<6.1	16	<3.8	<11	<13	<38	<4.7	24	<4.1	<5.8
VMP-95-60	10/1/2021	2-Month Static Rebound	N	Deep	<5.8	<4.3	24	<4.3	<15	<3.4	<13	<5.2	15	33	<3.8	17	<13	<37	<4.6	160	<4.0	15
VMP-95-60	1/11/2022	6-Month Static Rebound	N	Deep	7.6	<3.8	62	<3.8	<13	<3.0	<12	9.5	36	73	<3.3	53	<11	<32	<4.1	190	<3.5	22

Notes:

All results reported in micrograms per cubic meter ($\mu g/m^3$)

Modifiers: N = Original Sample; FD = Field Duplicate Sample

J = Estimated value, concentration below the reporting limit but above the method detection limit

N = presumptive evidence of a compound

-99999R = Result rejected during data validation

NA = Not Analyzed

[1] Sample collected after increasing flow rate and sampling approximately 34 minutes after initial sample.

Table A-6. Soil Core Analytical Schedule

Top of Sample Depth (feet below land surface)	Analytes/Parameters			
	Volatile Organic Compound[1]	Total Organic Carbon	Moisture Content	Resistivity[2]
5	X			
10	X	X	X	
15	X			X
20	X	X	X	
25	X			X
30	X	X	X	
35	X			X
40	X	X	X	
45	X			X
50	X	X	X	
55	X			X
60	X	X	X	
65	X			X
70	X	X	X	
75	X			X
80	X	X	X	
85	X			X
90	X	X	X	
91 to 95[3]				
95	X	X		
96 to 105[3]				
105	X	X		
106 to 110[3]				

At soil borings SB-2102 and 2107

1 Soil samples from 5 to 90 feet were field screened using a photoionization detector (PID). The soil sample with the highest PID reading within each ten foot interval (eg 0 to 10, >10 to 20, etc) was submitted to laboratory for volatile organic compound analysis. Soil borings adjacent to membrane interface probes (MIPs) had sample intervals modified based on the MIP profiles.

2 Portions of the soil cores collected for electrical resistivity analysis from the soil borings were shipped to a laboratory that composited samples from the same depth intervals from multiple soil borings.

Table A-7. Soil Boring Summary

Sampling Information		Construction Information	
Soil Boring Location[1]	Membrane Interface Probe (MIP) Location[2]	VMP Location[3]	SVE Location[4]
SB-2101	MIP-2101		
SB-2102			
SB-2103			VE-45D
SB-2104	MIP-2104		VE-46D
SB-2105		VMP-117	
SB-2106			VE-47S
SB-2107	MIP-2107		VE-48S/D
SB-2108	MIP-2108	VMP-118	
SB-2109			VE-49S/D
SB-2110			VE-50S/D
SB-2111	MIP-2111		VE-51S/D

[1] = See below summary of analytes

[2] = A membrane-interface probe was used to conduct soil profiling prior to installing soil boring.

[3] = Vapor monitoring probes (VMPs) were constructed at different depth intervals as outlined in lithologic logs.

[4] = Soil vapor extraction (SVE) well locations were completed as: two nested wells within a single borehole (S/D), one completed in the shallow zone and one completed in the deep zone; or only in shallow zone (S); or only in deep zone (D) as outlined in lithologic logs.

Table A-8. Detected Volatile Organic Compounds in Recent Soil Samples

Sample Location	Sample Date	Sample Top Depth (ft bgs)	Modifier	1,1,1-Trichloroethane (TCA)	1,1-Dichloroethene	1,2-Dichloroethane	Acetone	Benzene	Bromobenzene	Bromodichloromethane	Bromoform	Carbon disulfide	Dibromochloromethane	Ethylbenzene	Freon 11	Freon 113	m,p-Xylene	Methyl ethyl ketone	Methyl isobutyl ketone	Methylene chloride	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)
SB-2101	9/16/2021	5	N	<1.0	<1.0	<1.0	**19J**	**1**	<1.0	<1.0	<5.1	<10	<2.0	**0.23J**	<10	<10	<2.0	<20	<20	<10	<1.0	**0.87J**	<2.0
		15	N	<1.1	<1.1	<1.1	**21J**	**0.98J**	<1.1	<1.1	<5.5	<11	<2.2	<1.1	<11	<11	<2.2	<22	<22	<11	<1.1	<1.1	<2.2
		15	FD	<1.0	<1.0	<1.0	**28**	**0.87J**	<1.0	<1.0	<5.0	<10	<2.0	<1.0	<10	<10	<2.0	<20	<20	<10	<1.0	<1.0	<2.0
		25	N	<1.3	<1.3	<1.3	<25	**1.1J**	<1.3	<1.3	<6.3	<13	<2.5	<1.3	<13	<13	<2.5	<25	<25	<13	<1.3	<1.3	<2.5
		35	N	<0.91	<0.91	<0.91	**16J**	**1.9**	<0.91	<0.91	<4.5	<9.1	<1.8	<0.91	<9.1	<9.1	<1.8	<18	<18	<9.1	**0.35J**	**0.7J**	<1.8
		45	N	<0.91	<0.91	<0.91	**12J**	**1.7**	<0.91	<0.91	<4.6	<9.1	<1.8	<0.91	<9.1	<9.1	<1.8	<18	<18	<9.1	**0.63J**	**0.84J**	<1.8
		45	FD	<0.86	<0.86	<0.86	<17	**1.8**	<0.86	<0.86	<4.3	<8.6	<1.7	<0.86	<8.6	<8.6	<1.7	<17	<17	<8.6	**0.63J**	**0.7J**	<1.7
		60	N	<1.1	<1.1	<1.1	<22	**0.58J**	<1.1	<1.1	<5.5	<11	<2.2	**0.24J**	<11	<11	**0.93J**	<22	<22	<11	<1.1	**1.3**	<2.2
		65	N	<0.99	<0.99	<0.99	**12J**	<0.99	<0.99	<0.99	<5.0	<9.9	<2.0	<0.99	<9.9	<9.9	<2.0	<20	<20	<9.9	<0.99	<0.99	<2.0
		75	N	<0.74	<0.74	<0.74	<15	<0.74	<0.74	<0.74	<3.7	<7.4	<1.5	<0.74	<7.4	<7.4	<1.5	<15	<15	<7.4	<0.74	<0.74	<1.5
		85	N	<0.82	<0.82	<0.82	<16	<0.82	<0.82	<0.82	<4.1	<8.2	<1.6	<0.82	<8.2	<8.2	<1.6	<16	<16	<8.2	**0.39J**	<0.82	<1.6
SB-2102	9/14/2021	5	N	<1.2	<1.2	<1.2	**31**	**0.81J**	<1.2	<1.2	<6.0	<12	<2.4	<1.2	<12	<12	<2.4	<24	<24	<12	<1.2	<1.2	<2.4
		15	N	<0.89	<0.89	<0.89	<18	<0.89	<0.89	<0.89	<4.5	<8.9	<1.8	<0.89	<8.9	<8.9	<1.8	<18	<18	<8.9	**0.32J**	<0.89	<1.8
		15	FD	<1.1	<1.1	<1.1	<23	**0.43J**	<1.1	<1.1	<5.7	<11	<2.3	<1.1	<11	<11	<2.3	<23	<23	<11	**0.56J**	<1.1	<2.3
		25	N	<0.88	<0.88	<0.88	<18	**2.3**	<0.88	<0.88	<4.4	<8.8	<1.8	<0.88	<8.8	<8.8	<1.8	<18	<18	<8.8	**0.51J**	**1.2**	<1.8
		35	N	<0.98	<0.98	<0.98	<20	**1.3**	<0.98	<0.98	<4.9	<9.8	<2.0	<0.98	<9.8	<9.8	<2.0	<20	<20	<9.8	**0.86J**	<0.98	<2.0
		50	N	<0.84	<0.84	<0.84	<17	**2.2**	<0.84	<0.84	<4.2	<8.4	<1.7	<0.84	<8.4	<8.4	<1.7	<17	<17	<8.4	**0.91**	**0.99**	<1.7
		60	N	<0.92	<0.92	<0.92	**26**	**0.4J**	<0.92	<0.92	<4.6	<9.2	<1.8	<0.92	<9.2	<9.2	<1.8	<18	<18	<9.2	<0.92	<0.92	<1.8
		65	N	<1.3	<1.3	<1.3	<26	<1.3	<1.3	<1.3	<6.5	<13	<2.6	<1.3	<13	<13	<2.6	<26	<26	<13	<1.3	<1.3	<2.6
		80	N	<0.76	<0.76	<0.76	<15	**0.32J**	<0.76	<0.76	<3.8	<7.6	<1.5	<0.76	<7.6	<7.6	<1.5	<15	<15	<7.6	<0.76	<0.76	<1.5
		80	FD	<0.73	<0.73	<0.73	<15	**0.38J**	<0.73	<0.73	<3.7	<7.3	<1.5	<0.73	<7.3	<7.3	<1.5	<15	<15	<7.3	<0.73	<0.73	<1.5
		85	N	<0.86	<0.86	<0.86	<17	**0.38J**	<0.86	<0.86	<4.3	<8.6	<1.7	**0.38J**	<8.6	<8.6	<1.7	<17	<17	<8.6	<0.86	<0.86	<1.7
		95	N	<0.75	<0.75	<0.75	<15	**0.28J**	<0.75	<0.75	<3.8	<7.5	<1.5	<0.75	<7.5	<7.5	<1.5	<15	<15	<7.5	**1.4**	<0.75	**0.64J**
		105	N	<0.86	<0.86	<0.86	<17	**0.41J**	<0.86	<0.86	<4.3	<8.6	<1.7	<0.86	<8.6	**1.1J**	<1.7	<17	<17	<8.6	**1.9**	<0.86	<1.7
SB-2103	9/15/2021	5	N	<1.2	<1.2	<1.2	**26**	**0.93J**	<1.2	<1.2	<6.1	<12	<2.4	<1.2	<12	<12	<2.4	<24	<24	<12	**0.27J**	<1.2	<2.4
		15	N	<0.89	<0.89	<0.89	<18	**1.5**	<0.89	<0.89	<4.4	<8.9	<1.8	<0.89	<8.9	<8.9	<1.8	<18	<18	<8.9	**0.42J**	**0.57J**	<1.8
		25	N	<0.82	<0.82	<0.82	<16	**0.66J**	<0.82	<0.82	<4.1	<8.2	<1.6	<0.82	<8.2	<8.2	<1.6	<16	<16	<8.2	**0.22J**	<0.82	<1.6
		25	FD	<0.98	<0.98	<0.98	<20	**0.84J**	<0.98	<0.98	<4.9	<9.8	<2.0	<0.98	<9.8	<9.8	<2.0	<20	<20	<9.8	**0.52J**	<0.98	<2.0
		35	N	<1.1	<1.1	<1.1	<22	**0.75J**	<1.1	<1.1	<5.6	<11	<2.2	<1.1	<11	<11	<2.2	<22	<22	<11	**0.53J**	<1.1	<2.2
		45	N	<1.0	<1.0	<1.0	<20	**0.9J**	<1.0	<1.0	<5.1	<10	<2.0	<1.0	<10	<10	<2.0	<20	<20	<10	**1.1**	<1.0	<2.0
		55	N	<1.0	<1.0	<1.0	**24**	**0.61J**	<1.0	<1.0	<5.2	<10	<2.1	<1.0	<10	<10	<2.1	<21	<21	<10	**0.48J**	<1.0	<2.1
		65	N	<1.0	<1.0	<1.0	<21	<1.0	<1.0	<1.0	<5.1	<10	<2.1	<1.0	<10	<10	<2.1	<21	<21	<10	<1.0	<1.0	<2.1
		65	FD	<1.2	<1.2	<1.2	<23	<1.2	<1.2	<1.2	<5.9	<12	<2.3	<1.2	<12	<12	<2.3	<23	<23	<12	<1.2	<1.2	<2.3
		80	N	<0.94	<0.94	<0.94	**18J**	**0.25J**	<0.94	<0.94	<4.7	<9.4	<1.9	<0.94	<9.4	<9.4	<1.9	<19	<19	<9.4	<0.94	<0.94	<1.9
		85	N	<1.2	<1.2	<1.2	<24	<1.2	<1.2	<1.2	<5.9	<12	<2.4	<1.2	<12	<12	<2.4	<24	<24	<12	<1.2	<1.2	<2.4

Table A-8. Detected Volatile Organic Compounds in Recent Soil Samples

Sample Location	Sample Date	Sample Top Depth (ft bgs)	Modifier	1,1,1-Trichloroethane (TCA)	1,1-Dichloroethene	1,2-Dichloroethane	Acetone	Benzene	Bromobenzene	Bromodichloromethane	Bromoform	Carbon disulfide	Dibromochloromethane	Ethylbenzene	Freon 11	Freon 113	m,p-Xylene	Methyl ethyl ketone	Methyl isobutyl ketone	Methylene chloride	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)
SB-2104	8/3/2021	15	N	<1.0	<1.0	<1.0	<20	<1.0	<1.0	<1.0	<5.1	<10	<2.0	<1.0	<10	<10	<2.0	<20	<20	<10	**0.41J**	<1.0	<2.0
		19	N	<0.83	<0.83	<0.83	**8.2J**	**0.68J**	<0.83	<0.83	<4.1	<8.3	<1.7	<0.83	<8.3	<8.3	<1.7	<17	<17	<8.3	**0.37J**	<0.83	<1.7
		19	FD	<0.81	<0.81	<0.81	<16	**0.7J**	<0.81	<0.81	<4.1	<8.1	<1.6	<0.81	<8.1	<8.1	<1.6	<16	<16	<8.1	**0.59J**	<0.81	<1.6
		30	N	<0.91	<0.91	<0.91	**16J**	**0.48J**	<0.91	<0.91	<4.6	<9.1	<1.8	<0.91	<9.1	<9.1	<1.8	<18	<18	<9.1	**0.85J**	<0.91	<1.8
		35	N	<0.80	<0.80	<0.80	<16	**1.3**	<0.80	<0.80	<4.0	<8.0	<1.6	<0.80	<8.0	<8.0	<1.6	<16	<16	<8.0	**0.9**	**0.54J**	<1.6
		52	N	<0.91	<0.91	<0.91	**11J**	**0.53J**	<0.91	<0.91	<4.6	<9.1	<1.8	<0.91	<9.1	<9.1	<1.8	<18	<18	<9.1	**0.51J**	<0.91	<1.8
		52	FD	<1.1	<1.1	<1.1	**14J**	**0.42J**	<1.1	<1.1	<5.3	<11	<2.1	<1.1	<11	<11	<2.1	<21	<21	<11	**0.37J**	<1.1	<2.1
		60	N	<1.1	<1.1	<1.1	<21	<1.1	<1.1	<1.1	<5.3	<11	<2.1	<1.1	<11	<11	<2.1	<21	<21	<11	<1.1	<1.1	<2.1
		65	N	<0.75	<0.75	<0.75	<15	**0.27J**	<0.75	<0.75	<3.8	<7.5	<1.5	<0.75	<7.5	<7.5	<1.5	<15	<15	<7.5	**0.94**	<0.75	<1.5
		75	N	<1.0	<1.0	<1.0	**15J**	<1.0	<1.0	<1.0	<5.0	<10	<2.0	<1.0	<10	<10	<2.0	<20	<20	<10	<1.0	<1.0	<2.0
		85	N	<0.77	<0.77	<0.77	**9.1J**	<0.77	<0.77	<0.77	<3.9	<7.7	<1.5	<0.77	<7.7	<7.7	<1.5	<15	<15	<7.7	**2**	<0.77	<1.5
SB-2105	9/8/2021	10	N	<1.5	<1.5	<1.5	**30**	**1.3J**	<1.5	<1.5	<7.4	<15	<3.0	<1.5	<15	<15	<3.0	<30	<30	<15	<1.5	<1.5	<3.0
		20	N	<0.83	<0.83	<0.83	<17	**1.8**	<0.83	<0.83	<4.2	<8.3	<1.7	<0.83	<8.3	<8.3	<1.7	<17	<17	<8.3	**0.23J**	**0.83**	<1.7
		30	N	<0.93	<0.93	<0.93	<19	**0.37J**	<0.93	<0.93	<4.7	<9.3	<1.9	<0.93	<9.3	<9.3	<1.9	<19	<19	<9.3	**0.49J**	<0.93	<1.9
		40	N	<0.80	<0.80	<0.80	**9.4J**	**1.3**	<0.80	<0.80	<4.0	<8.0	<1.6	<0.80	<8.0	<8.0	<1.6	<16	<16	<8.0	**0.76J**	<0.80	<1.6
		50	N	<0.85	<0.85	<0.85	<17	**0.69J**	<0.85	<0.85	<4.2	<8.5	<1.7	<0.85	<8.5	<8.5	<1.7	<17	<17	<8.5	**0.52J**	<0.85	<1.7
		50	FD	<1.0	<1.0	<1.0	<20	**1.1**	<1.0	<1.0	<5.0	<10	<2.0	<1.0	<10	<10	<2.0	<20	<20	<10	**1.1**	<1.0	<2.0
		55	N	<0.97	<0.97	<0.97	**26**	**0.37J**	<0.97	<0.97	<4.9	<9.7	<1.9	<0.97	<9.7	<9.7	<1.9	**5J**	<19	<9.7	**0.39J**	<0.97	<1.9
		65	N	<1.2	<1.2	<1.2	**35**	**0.42J**	<1.2	<1.2	<5.8	<12	<2.3	<1.2	<12	<12	<2.3	<23	<23	<12	**0.48J**	<1.2	<2.3
		65	FD	<0.96	<0.96	<0.96	**12J**	<0.96	<0.96	<0.96	<4.8	<9.6	<1.9	<0.96	<9.6	<9.6	<1.9	<19	<19	<9.6	**0.3J**	<0.96	<1.9
		75	N	<1.1	<1.1	<1.1	**14J**	<1.1	<1.1	<1.1	<5.4	<11	<2.2	<1.1	<11	<11	<2.2	<22	<22	<11	<1.1	<1.1	<2.2
		85	N	<0.81	<0.81	<0.81	**8.2J**	<0.81	<0.81	<0.81	<4.1	<8.1	<1.6	<0.81	<8.1	<8.1	<1.6	<16	<16	<8.1	**0.83**	<0.81	<1.6
SB-2106	9/9/2021	5	N	<0.81	<0.81	<0.81	**17**	**0.66J**	<0.81	<0.81	<4.0	<8.1	<1.6	<0.81	<8.1	<8.1	<1.6	**4J**	<16	<8.1	<0.81	<0.81	<1.6
		15	N	<0.97	<0.97	<0.97	**14J**	**0.25J**	<0.97	<0.97	<4.9	<9.7	<1.9	<0.97	<9.7	<9.7	<1.9	<19	<19	<9.7	**0.34J**	<0.97	<1.9
		25	N	<1.0	<1.0	<1.0	**10J**	**0.77J**	<1.0	<1.0	<5.0	<10	<2.0	<1.0	<10	<10	<2.0	<20	<20	<10	**0.41J**	<1.0	<2.0
		40	N	<0.96	<0.96	<0.96	**14J**	**1.1**	<0.96	<0.96	<4.8	<9.6	<1.9	<0.96	<9.6	<9.6	<1.9	<19	<19	<9.6	**1.2**	<0.96	<1.9
		50	N	<1.2	<1.2	<1.2	**14J**	**2**	<1.2	<1.2	<6.0	<12	<2.4	<1.2	<12	<12	<2.4	<24	<24	**21**	**3**	**0.81J**	<2.4
		60	N	<0.92	<0.92	<0.92	**25**	**1.3**	<0.92	<0.92	<4.6	<9.2	<1.8	<0.92	<9.2	<9.2	<1.8	**5.4J**	<18	**17**	**1.8**	**0.64J**	<1.8
		70	N	<1.3	<1.3	<1.3	**23J**	**0.67J**	<1.3	<1.3	<6.4	<13	<2.5	<1.3	<13	<13	<2.5	<25	<25	**28**	**2**	<1.3	<2.5
		70	FD	<1.3	**0.39J**	<1.3	**17J**	**1J**	<1.3	<1.3	<6.4	<13	<2.6	<1.3	<13	<13	<2.6	<26	<26	**42**	**3.4**	<1.3	<2.6
		80	N	<0.84	<0.84	<0.84	**16J**	**0.27J**	<0.84	<0.84	<4.2	<8.4	<1.7	<0.84	<8.4	<8.4	<1.7	<17	<17	<8.4	**0.46J**	<0.84	<1.7
		90	N	<0.95	<0.95	<0.95	<19	<0.95	<0.95	<0.95	<4.7	<9.5	<1.9	<0.95	<9.5	<9.5	<1.9	<19	<19	<9.5	**3.8**	<0.95	<1.9
		90	FD	<0.84	<0.84	<0.84	**9.7J**	**0.35J**	<0.84	<0.84	**1.8J**	<8.4	<1.7	<0.84	<8.4	<8.4	<1.7	<17	<17	<8.4	**5.3**	<0.84	<1.7

Table A-8. Detected Volatile Organic Compounds in Recent Soil Samples

Sample Location	Sample Date	Sample Top Depth (ft bgs)	Modifier	1,1,1-Trichloroethane (TCA)	1,1-Dichloroethene	1,2-Dichloroethane	Acetone	Benzene	Bromobenzene	Bromodichloromethane	Bromoform	Carbon disulfide	Dibromochloromethane	Ethylbenzene	Freon 11	Freon 113	m,p-Xylene	Methyl ethyl ketone	Methyl isobutyl ketone	Methylene chloride	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)
SB-2107	9/10/2021	5	N	<0.88	<0.88	<0.88	**24**	**0.48J**	<0.88	<0.88	<4.4	<8.8	<1.8	<0.88	<8.8	<8.8	**0.45J**	<18	<18	<8.8	**0.37J**	<0.88	<1.8
		15	N	<1.0	<1.0	<1.0	<20	**0.42J**	<1.0	<1.0	<5.0	<10	<2.0	<1.0	<10	<10	<2.0	<20	<20	<10	**0.99J**	<1.0	<2.0
		20	FD	<0.87	<0.87	<0.87	**11J**	**0.34J**	<0.87	<0.87	<4.3	<8.7	<1.7	<0.87	<8.7	<8.7	<1.7	<17	<17	<8.7	**0.69J**	<0.87	<1.7
		25	N	<0.79	<0.79	<0.79	<16	**0.49J**	<0.79	<0.79	<3.9	<7.9	<1.6	<0.79	<7.9	<7.9	<1.6	<16	<16	<7.9	**0.67J**	<0.79	<1.6
		35	N	<0.91	<0.91	<0.91	<18	**1.5**	<0.91	<0.91	<4.6	<9.1	<1.8	<0.91	<9.1	<9.1	<1.8	<18	<18	<9.1	**2.2**	<0.91	<1.8
		45	N	<0.87	<0.87	<0.87	**11J**	**1.5**	<0.87	<0.87	<4.3	<8.7	<1.7	<0.87	<8.7	<8.7	<1.7	<17	<17	**3.7J**	**2**	<0.87	<1.7
		55	N	<1.0	<1.0	<1.0	**18J**	**5.5**	<1.0	<1.0	<5.0	<10	<2.0	<1.0	<10	<10	<2.0	**7.4J**	<20	**24**	**4.6**	**2.1**	<2.0
		62	N	<0.92	<0.92	**0.32J**	**22**	**2.8**	<0.92	<0.92	<4.6	<9.2	<1.8	<0.92	<9.2	<9.2	<1.8	**5.5J**	<18	**46**	**4.3**	**1.1**	<1.8
		62	FD	<0.92	<0.92	<0.92	**22**	**3.2**	<0.92	<0.92	<4.6	<9.2	<1.8	<0.92	<9.2	<9.2	<1.8	**5.8J**	<18	**22**	**2.8**	**1.6**	<1.8
		75	N	<0.85	<0.85	<0.85	**13J**	**0.48J**	<0.85	<0.85	<4.3	<8.5	<1.7	<0.85	<8.5	<8.5	<1.7	<17	<17	**17**	**2.2**	<0.85	<1.7
		85	N	<0.93	<0.93	<0.93	<19	<0.93	<0.93	<0.93	**4.8**	<9.3	<1.9	<0.93	<9.3	<9.3	<1.9	<19	<19	<9.3	**2.8**	<0.93	<1.9
	9/13/2021	96	N	<0.91	<0.91	<0.91	<18	**0.37J**	<0.91	<0.91	<4.5	<9.1	<1.8	<0.91	<9.1	**3.9J**	<1.8	<18	<18	<9.1	**15**	<0.91	<1.8
		105	N	<0.75	<0.75	<0.75	<15	**2.5**	<0.75	<0.75	<3.7	<7.5	<1.5	<0.75	**1.6J**	**3.1J**	<1.5	<15	<15	<7.5	<0.75	**0.98**	<1.5
SB-2108	8/19/2021	5	N	<1.0	<1.0	<1.0	**30**	**0.41J**	<1.0	<1.0	<5.1	<10	<2.0	<1.0	<10	<10	<2.0	**5J**	<20	<10	**0.99J**	<1.0	<2.0
		15	N	<0.86	<0.86	<0.86	<17	**0.35J**	<0.86	<0.86	<4.3	<8.6	<1.7	<0.86	<8.6	<8.6	<1.7	<17	<17	<8.6	**6.9**	<0.86	<1.7
		25	N	<0.90	<0.90	<0.90	<18	**0.67J**	<0.90	<0.90	<4.5	<9.0	<1.8	<0.90	<9.0	<9.0	<1.8	<18	<18	<9.0	**47**	<0.90	<1.8
		35	N	<0.90	<0.90	<0.90	**8.8J**	**1.7**	<0.90	<0.90	**2J**	<9.0	<1.8	<0.90	<9.0	<9.0	<1.8	<18	<18	<9.0	**18**	**0.55J**	**0.35J**
		42	N	<0.80	<0.80	<0.80	<16	**2.5**	<0.80	**0.23J**	**170E**	**0.5J**	**1.4J**	<0.80	<8.0	<8.0	<1.6	<16	<16	**2.8J**	**8.3**	<0.80	<1.6
		42	FD	<0.67	<0.67	<0.67	<13	**0.54J**	<0.67	<0.67	**160E**	<6.7	**1.1J**	<0.67	<6.7	<6.7	<1.3	<13	<13	<6.7	**1.2**	<0.67	<1.3
		50	N	<0.92	<0.92	<0.92	**9.5J**	**0.49J**	<0.92	<0.92	**5.1**	<9.2	<1.8	<0.92	<9.2	<9.2	<1.8	<18	<18	**4.8J**	**2.5**	<0.92	<1.8
		61	N	<0.81	<0.81	<0.81	**13J**	**1.3**	<0.81	<0.81	<4.1	<8.1	<1.6	<0.81	<8.1	<8.1	<1.6	**4.2J**	<16	**12**	**2.9**	**0.79J**	<1.6
		75	N	<0.86	<0.86	<0.86	<17	<0.86	**0.4J**	<0.86	**250E**	<8.6	**1.7**	<0.86	<8.6	<8.6	<1.7	<17	<17	<8.6	**1.2**	<0.86	<1.7
		84	N	<0.83	<0.83	<0.83	<17	<0.83	<0.83	<0.83	**44**	<8.3	<1.7	<0.83	<8.3	<8.3	<1.7	<17	<17	<8.3	**0.9**	<0.83	<1.7
		84	FD	<0.83	<0.83	<0.83	<17	<0.83	<0.83	<0.83	**140**	<8.3	**1.1J**	<0.83	<8.3	<8.3	<1.7	<17	<17	<8.3	**0.92**	<0.83	<1.7
SB-2109	8/18/2021	10	N	**0.28J**	<0.79	<0.79	**16**	**0.83**	<0.79	<0.79	<3.9	<7.9	<1.6	**0.16J**	<7.9	<7.9	<1.6	<16	<16	<7.9	**13**	**0.65J**	<1.6
		15	N	<0.73	<0.73	**0.39J**	**15**	**0.85**	<0.73	<0.73	<3.6	<7.3	<1.5	<0.73	<7.3	<7.3	<1.5	<15	<15	**3.3J**	**7.3**	<0.73	<1.5
		30	N	**0.65J**	<0.91	<0.91	**17J**	**2.1**	<0.91	<0.91	<4.5	<9.1	<1.8	<0.91	<9.1	<9.1	<1.8	<18	<18	<9.1	**16**	**0.91**	<1.8
		30	FD	**0.58J**	<0.77	**0.29J**	**9.2J**	**0.91**	<0.77	<0.77	<3.8	<7.7	<1.5	<0.77	<7.7	<7.7	<1.5	<15	<15	<7.7	**16**	<0.77	<1.5
		40	N	**0.26J**	<0.79	**0.51J**	**12J**	**1.7**	<0.79	<0.79	**3.8J**	<7.9	<1.6	<0.79	<7.9	<7.9	<1.6	<16	<16	**3.6J**	**5**	**0.76J**	<1.6
		45	N	<0.94	<0.94	**0.49J**	**16J**	**2**	<0.94	<0.94	**4.6J**	<9.4	<1.9	<0.94	<9.4	<9.4	<1.9	<19	<19	**9.8**	**4.2**	**0.95**	<1.9
		55	N	**0.39J**	<0.76	**0.64J**	**13J**	**2.7**	<0.76	<0.76	<3.8	<7.6	<1.5	<0.76	<7.6	<7.6	**0.45J**	<15	<15	**25**	**7.1**	**1.1**	<1.5
		65	N	<0.81	<0.81	**0.5J**	**31**	**2.9**	<0.81	<0.81	<4.0	<8.1	<1.6	**0.19J**	<8.1	<8.1	**0.56J**	**5.4J**	<16	**24**	**4.4**	**1.5**	<1.6
		80	N	<0.77	<0.77	<0.77	<15	<0.77	<0.77	**0.21J**	**220E**	**0.65J**	**1.8**	<0.77	<7.7	<7.7	<1.5	<15	<15	<7.7	**0.86**	<0.77	<1.5
		90	N	<0.82	<0.82	<0.82	<16	**0.25J**	<0.82	**0.44J**	**240E**	**0.52J**	**2.6**	<0.82	<8.2	<8.2	<1.6	<16	<16	<8.2	**1.4**	<0.82	<1.6

Table A-8. Detected Volatile Organic Compounds in Recent Soil Samples

Sample Location	Sample Date	Sample Top Depth (ft bgs)	Modifier	1,1,1-Trichloroethane (TCA)	1,1-Dichloroethene	1,2-Dichloroethane	Acetone	Benzene	Bromobenzene	Bromodichloromethane	Bromoform	Carbon disulfide	Dibromochloromethane	Ethylbenzene	Freon 11	Freon 113	m,p-Xylene	Methyl ethyl ketone	Methyl isobutyl ketone	Methylene chloride	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)
SB-2110	8/17/2021	10	N	<0.85	<0.85	<0.85	**31**	**1.1**	<0.85	<0.85	<4.3	<8.5	<1.7	**0.21J**	<8.5	<8.5	<1.7	**4.8J**	**2.8J**	<8.5	**1.1**	**0.79J**	<1.7
		15	N	<0.86	<0.86	<0.86	**17**	**0.96**	**0.19J**	<0.86	**110**	<8.6	**1J**	<0.86	<8.6	<8.6	<1.7	<17	<17	<8.6	**1.8**	<0.86	<1.7
		25	N	<0.83	<0.83	<0.83	<17	**1.6**	<0.83	<0.83	**170E**	**0.43J**	**2.2**	<0.83	<8.3	<8.3	<1.7	<17	<17	<8.3	**2.7**	<0.83	<1.7
		35	N	<0.93	<0.93	<0.93	<19	**0.46J**	<0.93	<0.93	**56**	<9.3	<1.9	<0.93	<9.3	<9.3	<1.9	<19	<19	<9.3	**3.9**	<0.93	<1.9
		40	N	<0.81	<0.81	<0.81	<16	**0.98**	<0.81	<0.81	**4**	<8.1	<1.6	<0.81	<8.1	<8.1	<1.6	<16	<16	**3.2J**	**2.1**	<0.81	<1.6
		50	N	<0.83	<0.83	<0.83	<17	**1.8**	<0.83	<0.83	**38**	<8.3	**0.53J**	<0.83	<8.3	<8.3	<1.7	<17	<17	**9.5**	**3.9**	**0.77J**	<1.7
		55	N	<0.96	<0.96	<0.96	**9.4J**	**1.5**	<0.96	<0.96	<4.8	<9.6	<1.9	<0.96	<9.6	<9.6	<1.9	<19	<19	**17**	**2.2**	**0.64J**	<1.9
		55	FD	<1.2	<1.2	**2.5**	**12J**	**1.6**	<1.2	<1.2	<5.8	<12	<2.3	<1.2	<12	<12	<2.3	<23	<23	**22**	**3**	<1.2	<2.3
		80	N	<0.80	<0.80	**0.4J**	**8.5J**	**0.22J**	<0.80	<0.80	<4.0	<8.0	<1.6	<0.80	<8.0	<8.0	<1.6	<16	<16	<8.0	**0.79J**	<0.80	<1.6
		80	FD	<0.87	<0.87	**0.5J**	**17**	<0.87	<0.87	<0.87	<4.4	<8.7	<1.7	<0.87	**0.27J**	<8.7	<1.7	<17	<17	<8.7	**0.75J**	<0.87	<1.7
		90	N	<1.1	<1.1	<1.1	<23	**0.6J**	<1.1	<1.1	<5.7	<11	<2.3	<1.1	<11	<11	<2.3	<23	<23	<11	**0.58J**	<1.1	<2.3
SB-2111	8/2/2021	10	N	<0.76	<0.76	<0.76	**13J**	**0.44J**	<0.76	<0.76	<3.8	<7.6	<1.5	<0.76	<7.6	<7.6	<1.5	<15	<15	<7.6	<0.76	<0.76	<1.5
		20	N	<0.75	<0.75	<0.75	<15	**1.2**	<0.75	<0.75	<3.8	<7.5	<1.5	<0.75	<7.5	<7.5	**0.61J**	<15	<15	<7.5	**0.2J**	**0.74J**	<1.5
		25	N	<0.73	<0.73	<0.73	**12J**	**0.35J**	<0.73	<0.73	<3.6	<7.3	<1.5	<0.73	<7.3	<7.3	<1.5	<15	<15	<7.3	**0.19J**	<0.73	<1.5
		40	N	<0.65	<0.65	<0.65	<13	**0.46J**	<0.65	<0.65	<3.3	<6.5	<1.3	<0.65	<6.5	<6.5	**0.38J**	<13	<13	<6.5	**0.38J**	<0.65	<1.3
		50	N	<0.88	<0.88	<0.88	**9.4J**	**0.61J**	<0.88	<0.88	<4.4	<8.8	<1.8	<0.88	<8.8	<8.8	**0.51J**	<18	<18	**3J**	**0.93**	<0.88	<1.8
		60	N	<0.75	<0.75	<0.75	**20**	**0.33J**	<0.75	<0.75	<3.8	<7.5	<1.5	<0.75	<7.5	<7.5	**0.43J**	<15	<15	<7.5	**0.63J**	<0.75	<1.5
		60	FD	<0.80	<0.80	<0.80	**25**	**0.49J**	<0.80	<0.80	<4.0	<8.0	<1.6	<0.80	<8.0	<8.0	<1.6	<16	<16	**2.7J**	**1.2**	<0.80	<1.6
		70	N	<0.82	<0.82	<0.82	**18**	**1.5**	<0.82	<0.82	**1.6J**	<8.2	<1.6	<0.82	<8.2	<8.2	<1.6	<16	<16	<8.2	**2.3**	**0.58J**	<1.6
		75	N	<0.71	<0.71	<0.71	**16**	**0.29J**	<0.71	<0.71	<3.5	<7.1	<1.4	<0.71	<7.1	<7.1	<1.4	<14	<14	<7.1	**0.75**	<0.71	<1.4
		90	N	<0.74	<0.74	<0.74	**15**	**0.37J**	<0.74	<0.74	<3.7	<7.4	<1.5	<0.74	<7.4	<7.4	<1.5	<15	<15	<7.4	**0.72J**	<0.74	**0.37J**

Notes:

All results reported in micrograms per kilogram

Modifiers: N = Original Sample; FD = Field Duplicate Sample

ft bgs = feet below ground surface

J = Estimated value

Table A-9. Fractional Organic Carbon and Moisture Content in Recent Soil Samples

Sample Location	Sample Date	Sample Top Depth (ft bgs)	Moisture/Tnfr (%)	Fractional Organic Carbon (g/g)
SB-2101	16-Sep-21	10	11	0.00166
SB-2101	16-Sep-21	20	15	0.00115
SB-2101	16-Sep-21	30	14	0.001U
SB-2101	16-Sep-21	40	12	0.00132
SB-2101	16-Sep-21	50	8.4	0.00115
SB-2101	16-Sep-21	60	8.4	0.001U
SB-2101	16-Sep-21	70	2.8	0.001U
SB-2101	16-Sep-21	80	16	0.001U
SB-2101	16-Sep-21	90	15	0.00321
SB-2102	14-Sep-21	10	11	0.00113
SB-2102	14-Sep-21	20	12	0.00165
SB-2102	14-Sep-21	30	14	0.00104
SB-2102	14-Sep-21	40	11	0.001U
SB-2102	14-Sep-21	50	14	0.00163
SB-2102	14-Sep-21	60	17	0.00121
SB-2102	14-Sep-21	70	2.3	0.001U
SB-2102	14-Sep-21	80	13	0.000624J
SB-2102	14-Sep-21	90	8.4	0.001U
SB-2102	14-Sep-21	95	NS	0.001U
SB-2102	14-Sep-21	105	NS	0.001U
SB-2103	15-Sep-21	12	11	0.00142
SB-2103	15-Sep-21	20	7.6	0.001U
SB-2103	15-Sep-21	30	12	0.000835J
SB-2103	15-Sep-21	40	15	0.001U
SB-2103	15-Sep-21	50	12	0.00164
SB-2103	15-Sep-21	60	18	0.001U
SB-2103	15-Sep-21	70	4.4	0.00074J
SB-2103	15-Sep-21	80	12	0.001U
SB-2103	15-Sep-21	90	14	0.001U
SB-2104	03-Aug-21	10	9.5	0.00251*
SB-2104	03-Aug-21	20	16	0.000475J
SB-2104	03-Aug-21	30	13	0.00105
SB-2104	03-Aug-21	40	12	0.000922J
SB-2104	03-Aug-21	50	7.7	0.001U
SB-2104	03-Aug-21	60	3.2	0.001U
SB-2104	03-Aug-21	70	2.9	0.001U
SB-2104	03-Aug-21	80	15	0.00115
SB-2104	03-Aug-21	90	12	0.001U
SB-2105	08-Sep-21	10	8.1	0.00123
SB-2105	08-Sep-21	20	13	0.00131

Table A-9. Fractional Organic Carbon and Moisture Content in Recent Soil Samples

Sample Location	Sample Date	Sample Top Depth (ft bgs)	Moisture/Tnfr (%)	Fractional Organic Carbon (g/g)
SB-2105	08-Sep-21	30	13	0.001U
SB-2105	08-Sep-21	40	11	0.000974J
SB-2105	08-Sep-21	50	13	0.000791J
SB-2105	08-Sep-21	60	4.9	NS
SB-2105	08-Sep-21	70	11	0.001U
SB-2105	08-Sep-21	80	13	0.001U
SB-2105	08-Sep-21	90	13	0.001U
SB-2106	09-Sep-21	20	15	0.001U
SB-2106	09-Sep-21	30	15	0.001U
SB-2106	09-Sep-21	40	11	0.000655J
SB-2106	09-Sep-21	50	16	0.001U
SB-2106	09-Sep-21	60	21	0.001U
SB-2106	09-Sep-21	70	14	0.001U
SB-2106	09-Sep-21	80	15	0.000576J
SB-2106	09-Sep-21	90	16	0.000755J
SB-2107	10-Sep-21	10	12	0.00177
SB-2107	10-Sep-21	20	11	0.001U,*
SB-2107	10-Sep-21	30	15	0.000882J
SB-2107	10-Sep-21	40	13	0.001U
SB-2107	10-Sep-21	50	17	0.00251
SB-2107	10-Sep-21	60	19	0.001U
SB-2107	10-Sep-21	70	14	0.001U
SB-2107	10-Sep-21	80	14	0.001U
SB-2107	13-Sep-21	90	16	0.000884J
SB-2107	13-Sep-21	96	NS	0.000783J
SB-2107	13-Sep-21	105	NS	0.001U
SB-2108	19-Aug-21	10	9.1	0.00159
SB-2108	19-Aug-21	20	8.8	0.0017
SB-2108	19-Aug-21	30	14	0.00235
SB-2108	19-Aug-21	40	14	0.00156
SB-2108	19-Aug-21	50	13	0.00155
SB-2108	19-Aug-21	61	16	0.00221
SB-2108	19-Aug-21	70	11	0.00237
SB-2108	19-Aug-21	80	15	0.001U
SB-2108	19-Aug-21	90	16	0.000658J
SB-2109	18-Aug-21	10	12	0.001U
SB-2109	18-Aug-21	20	13	0.000716J
SB-2109	18-Aug-21	30	14	0.000428J
SB-2109	18-Aug-21	40	14	0.001U
SB-2109	18-Aug-21	50	13	0.001U

Table A-9. Fractional Organic Carbon and Moisture Content in Recent Soil Samples

Sample Location	Sample Date	Sample Top Depth (ft bgs)	Moisture/Tnfr (%)	Fractional Organic Carbon (g/g)
SB-2109	18-Aug-21	60	12	0.000685J
SB-2109	18-Aug-21	70	18	0.00361
SB-2109	18-Aug-21	80	10	0.001U
SB-2109	18-Aug-21	90	12	0.000975J
SB-2110	17-Aug-21	10	14	0.00111
SB-2110	17-Aug-21	20	12	0.00082J
SB-2110	17-Aug-21	30	12	0.000979J
SB-2110	17-Aug-21	40	14	0.000525J
SB-2110	17-Aug-21	50	13	0.000574J
SB-2110	17-Aug-21	60	13	0.001U
SB-2110	17-Aug-21	70	14	0.000607J
SB-2110	17-Aug-21	80	12	0.001U
SB-2110	17-Aug-21	90	13	0.001U
SB-2111	02-Aug-21	10	14	0.00227
SB-2111	02-Aug-21	20	16	0.000812J
SB-2111	02-Aug-21	30	16	0.000529J
SB-2111	02-Aug-21	40	14	0.001U
SB-2111	02-Aug-21	50	17	0.000823J
SB-2111	02-Aug-21	60	15	0.000434J
SB-2111	02-Aug-21	70	15	0.001U
SB-2111	02-Aug-21	80	13	0.001U
SB-2111	02-Aug-21	90	16	0.000815J

Notes:

ft bgs = feet below ground surface

g/g = gram per gram

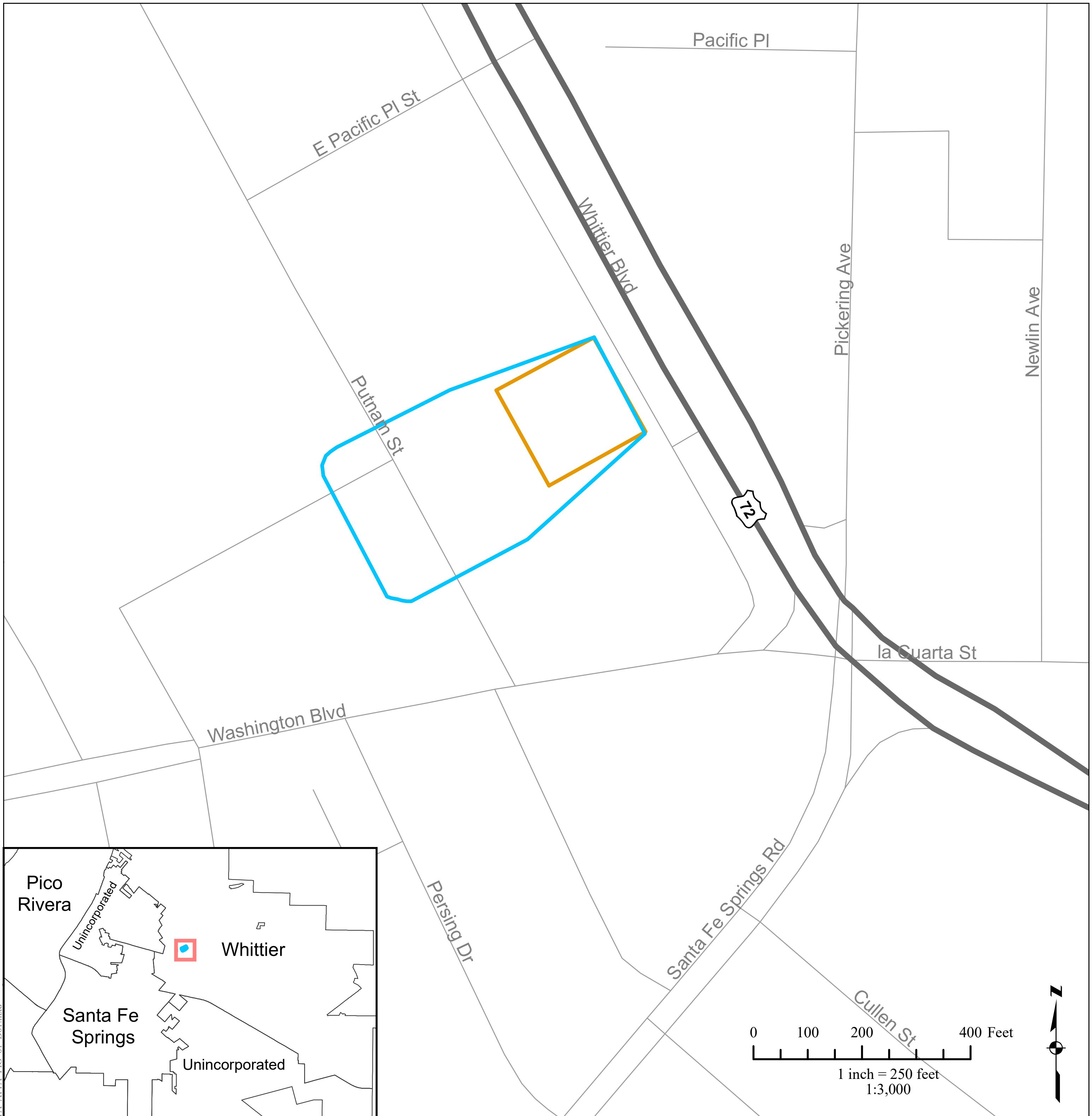
U = the analyte was analyzed for but no quantifiable concentration was found

J = approximate concentration

NS = Not Sampled

SB = Soil Boring

FIGURES



EXPLANATION

OU1 BOUNDARY

FORMER OMEGA CHEMCIAL PROPERTY

FIGURE A-1
LOCATION MAP

DATA COLLECTION PROGRAM
OPERABLE UNIT 1

Engineering Analytics, Inc.

Document Path: G:\151090\OU1_OPOG\RP_2203_DCEPA\mxd\OPG_OU1DCEPA_APPA_FIG_01_D01.mxd

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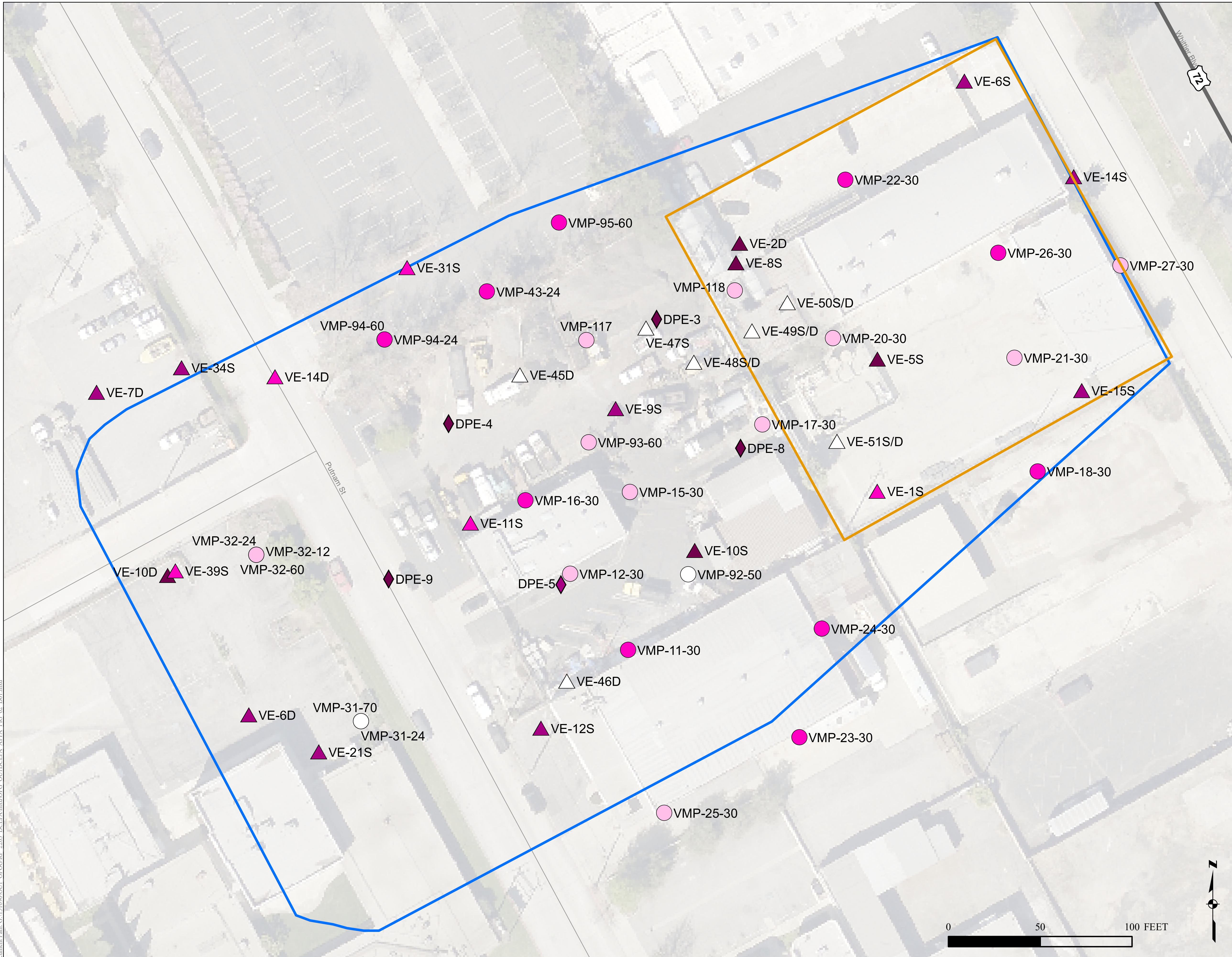

EXPLANATION

OU1

FORMER OMEGA CHEMICAL PROPERTY

VAPOR MONITORING PROBE

NUMBER OF SAMPLING EVENTS

0

1

2

SOIL VAPOR EXTRACTION WELL

NUMBER OF SAMPLING EVENTS

0

2

3

4

DUAL-PHASE EXTRACTION WELL

NUMBER OF SAMPLING EVENTS

3

4

NOTES:

DPE = DUAL PHASE EXTRACTION WELL
VE = SOIL VAPOR EXTRACTION WELL
VMP = VAPOR MONITORING PROBE
OU-1 = OPERABLE UNIT ONE

VMP-117, VMP-118, AND VE WELLS WITH ZERO SAMPLING EVENTS ARE NEWLY INSTALLED.

FIGURE A-2
RECENT SOIL VAPOR
SAMPLING LOCATIONS

DATA COLLECTION PROGRAM
OMEGA OU1

Engineering Analytics, Inc.

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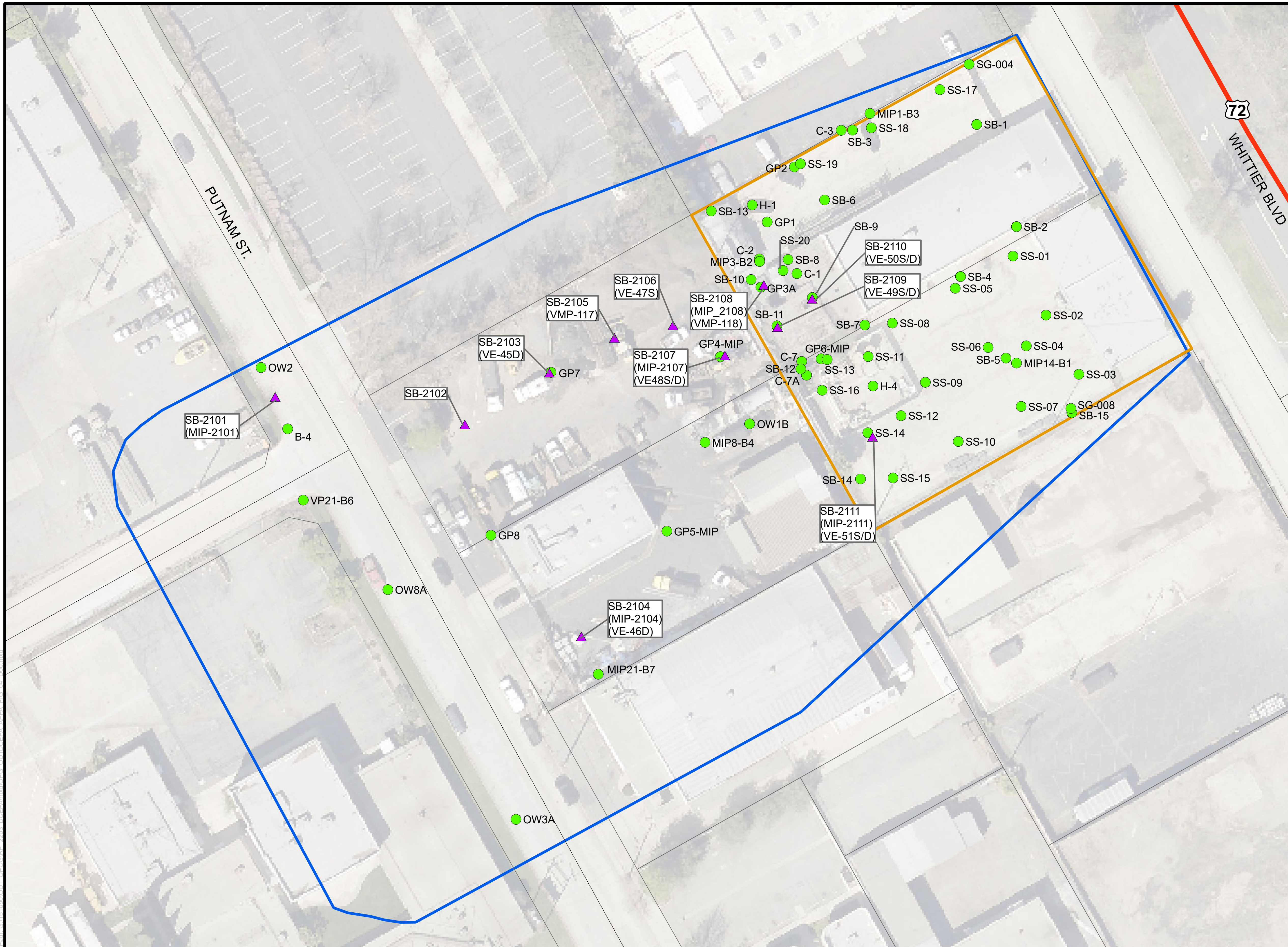
Project No. 151090

4/12/2022

Engineering Analytics, Inc.

FIGURE A-3
MEMBRANE INTERFACE PROBE LOCATIONS



EXPLANATION

- HISTORIC SOIL BORING
- RECENT SOIL BORING
- FORMER OMEGA FACILITY BOUNDARY
- PARCEL BOUNDARIES
- OPERABLE UNIT 1

NOTES:

Membrane Interface Probes are in close proximity to soil boring.

Vapor Monitoring Probes (VMP) and Soil Vapor Extraction wells (VE) were installed in the same location as soil borings.

Vapor extraction wells are labeled S for shallow if completed within 30 feet of ground surface, or D for deep if completed at depths greather than 30 feet below ground surface.

N

0 25 50 100 Feet

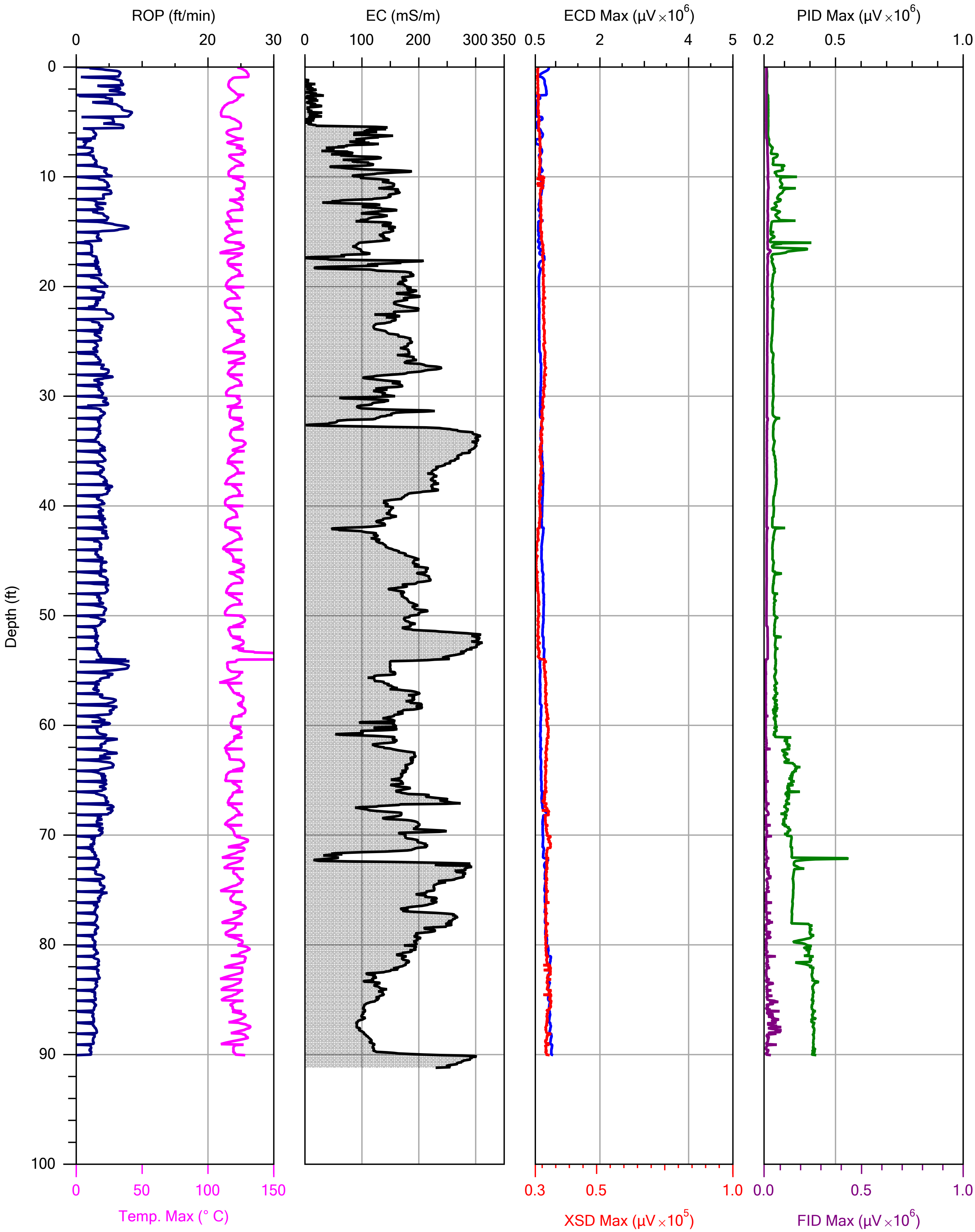
Project No. 151103

Engineering Analytics, Inc.

4/12/2022

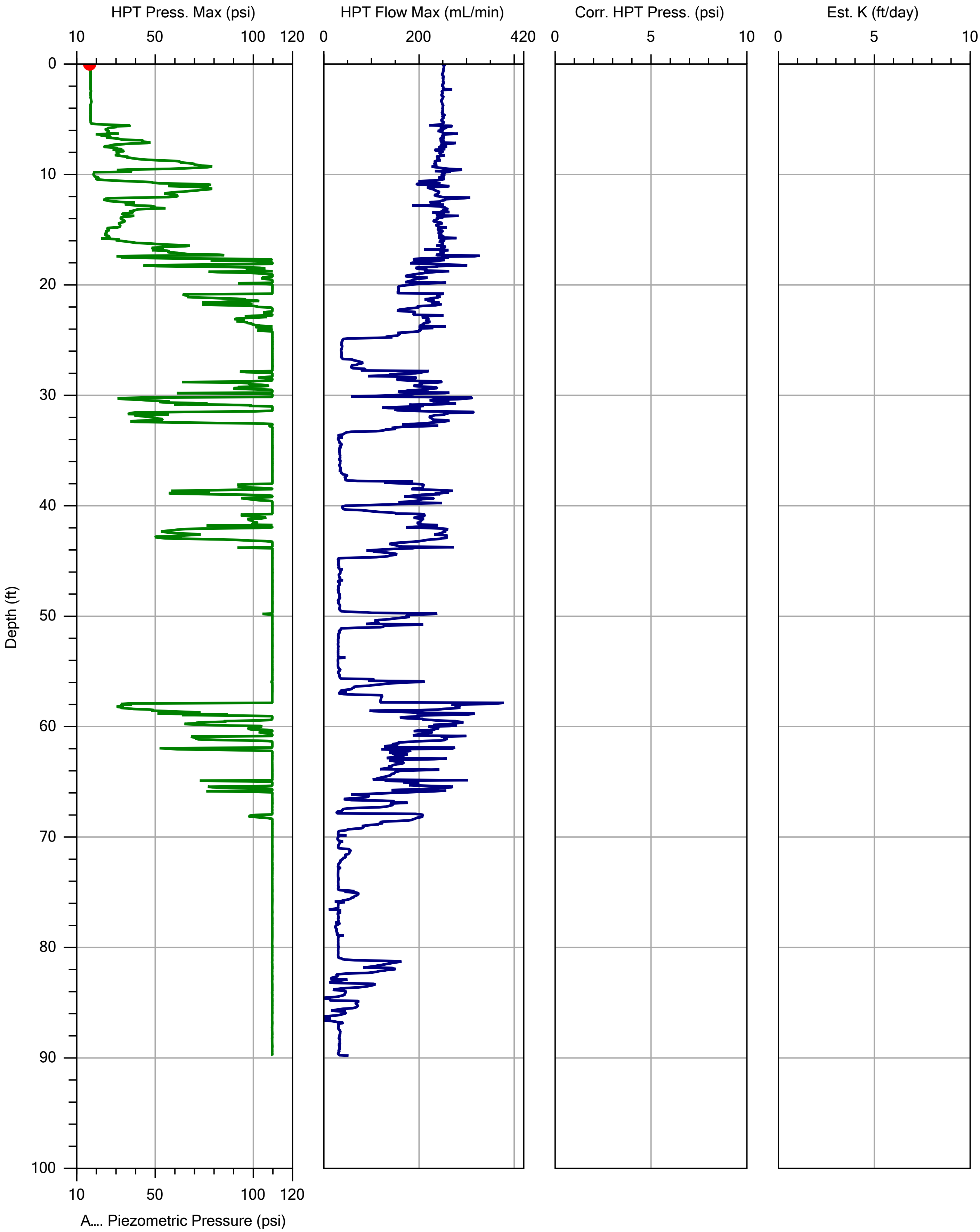
FIGURE A-4
SOIL BORING LOCATIONS

ATTACHMENT 1
MIP PROFILES



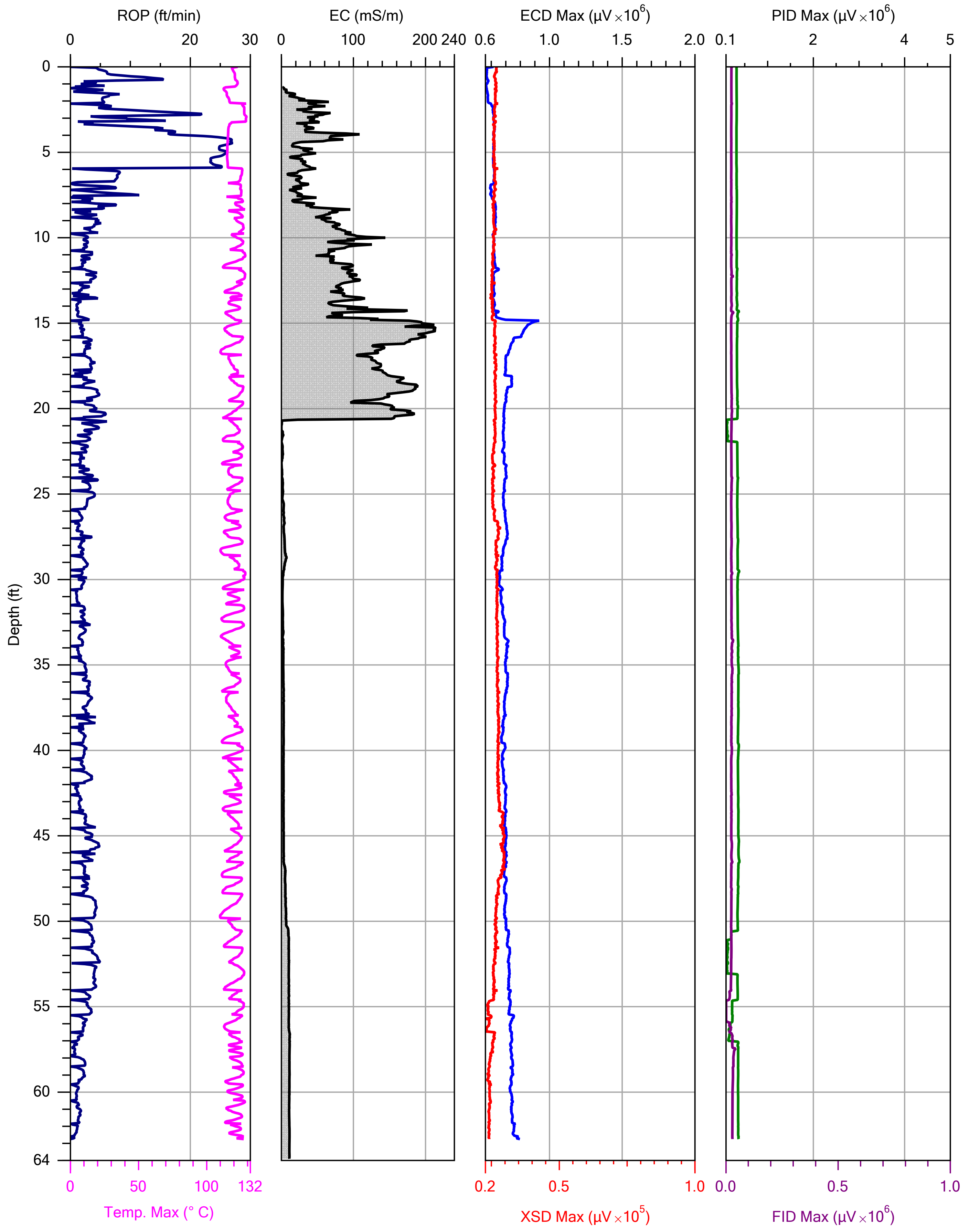
CASCADE
DRILLING | TECHNICAL SERVICES

		File: SB-2111.MHP
Company: Cascade	Operator: C Terry	Date: 07/27/21
Project ID: Omega OU1	Client: CDM Smith	Location: Whittier, CA



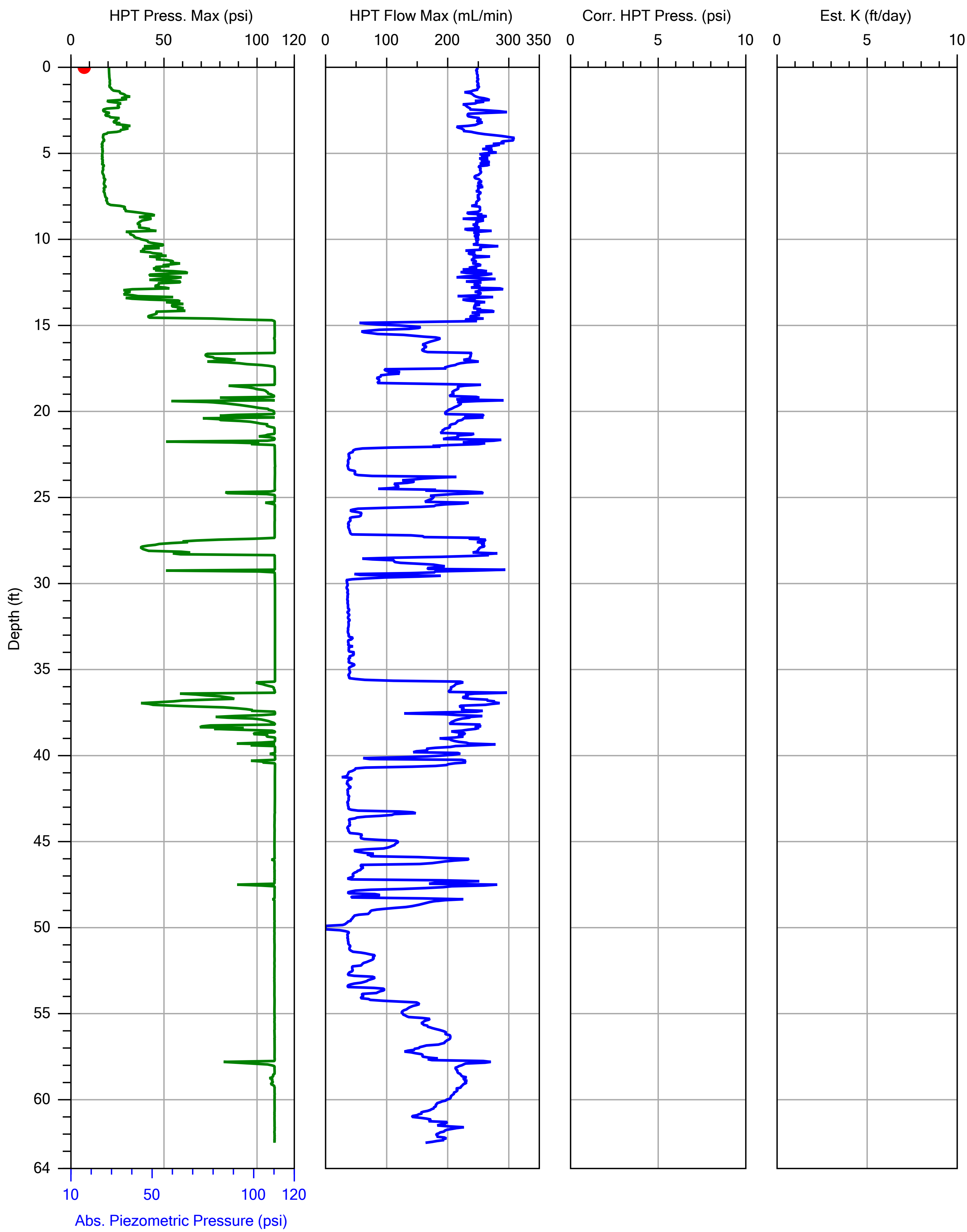
CASCADE
DRILLING | TECHNICAL SERVICES

		File: SB-2111.MHP
Company: Cascade	Operator: C Terry	Date: 07/27/21
Project ID: Omega OU1	Client: CDM Smith	Location: Whittier, CA



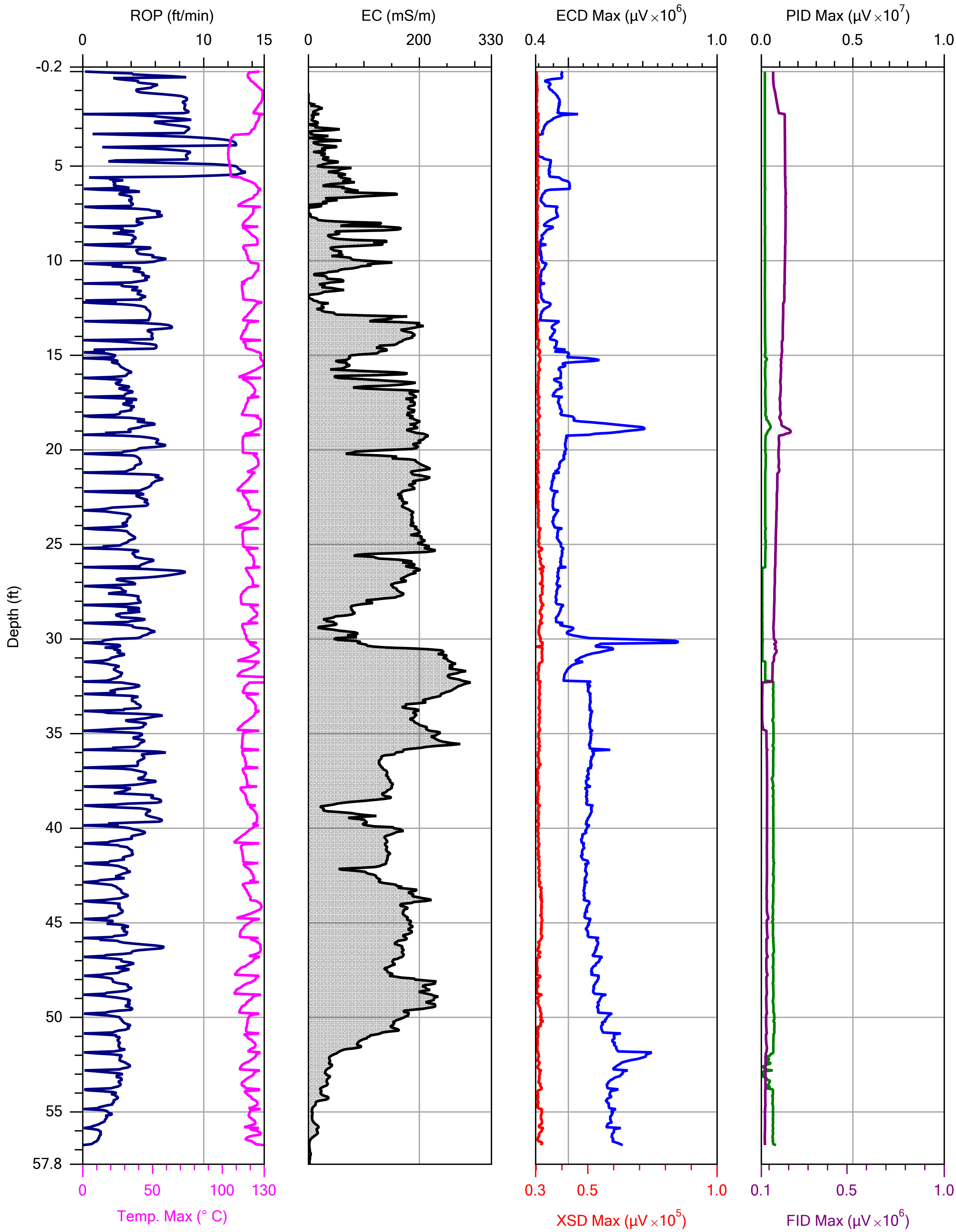
CASCADE
DRILLING | TECHNICAL SERVICES

		File: SB-2101.MHP
Company: Cascade	Operator: C Terry	Date: 9/8/2021
Project ID: Omega OU1	Client: CDM Smith	Location: Whittier, CA



CASCADE
DRILLING | TECHNICAL SERVICES

		File: SB-2101.MHP
Company: Cascade	Operator: C Terry	Date: 9/8/2021
Project ID: Omega OU1	Client: CDM Smith	Location: Whittier, CA



CASCADE
DRILLING | TECHNICAL SERVICES

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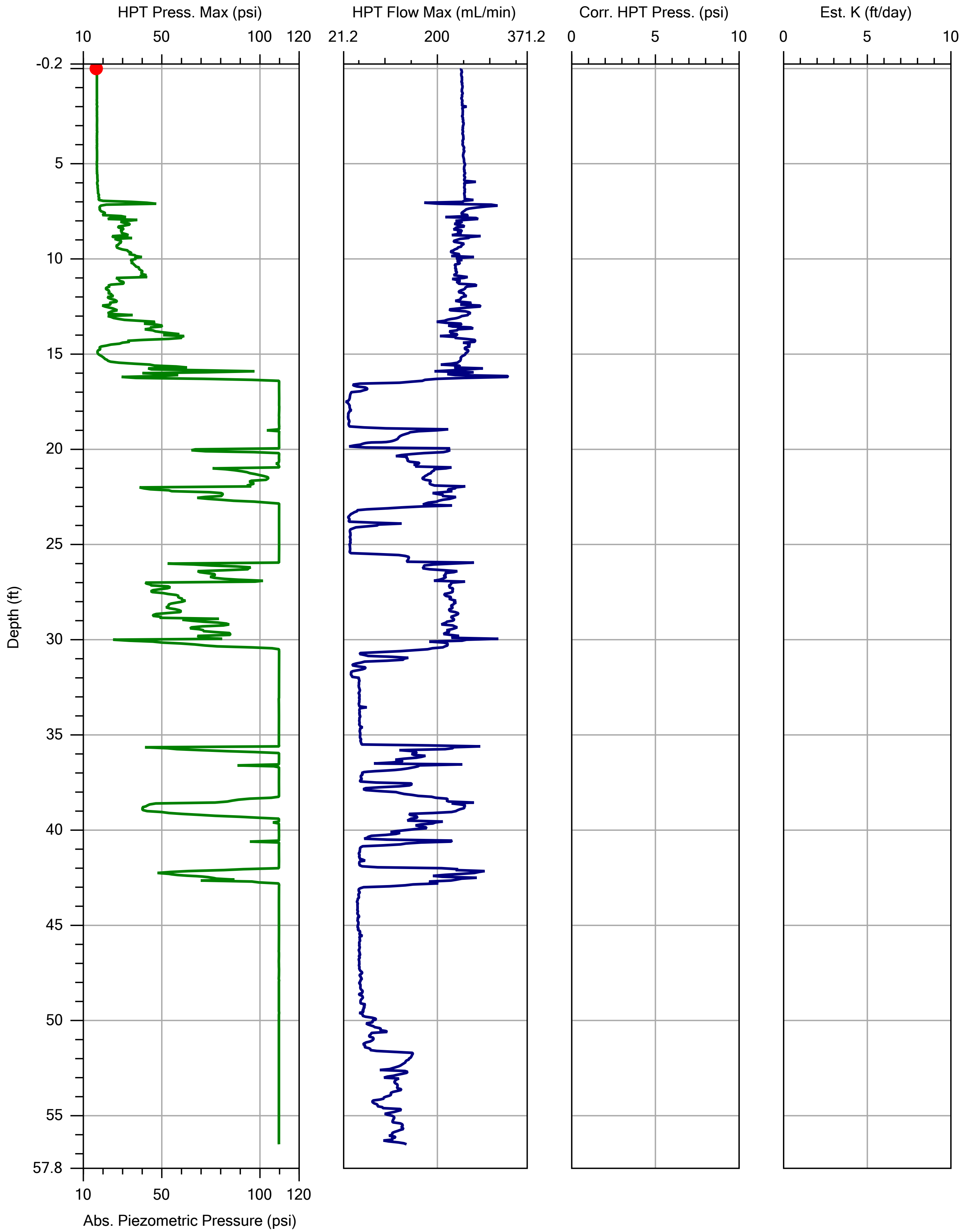
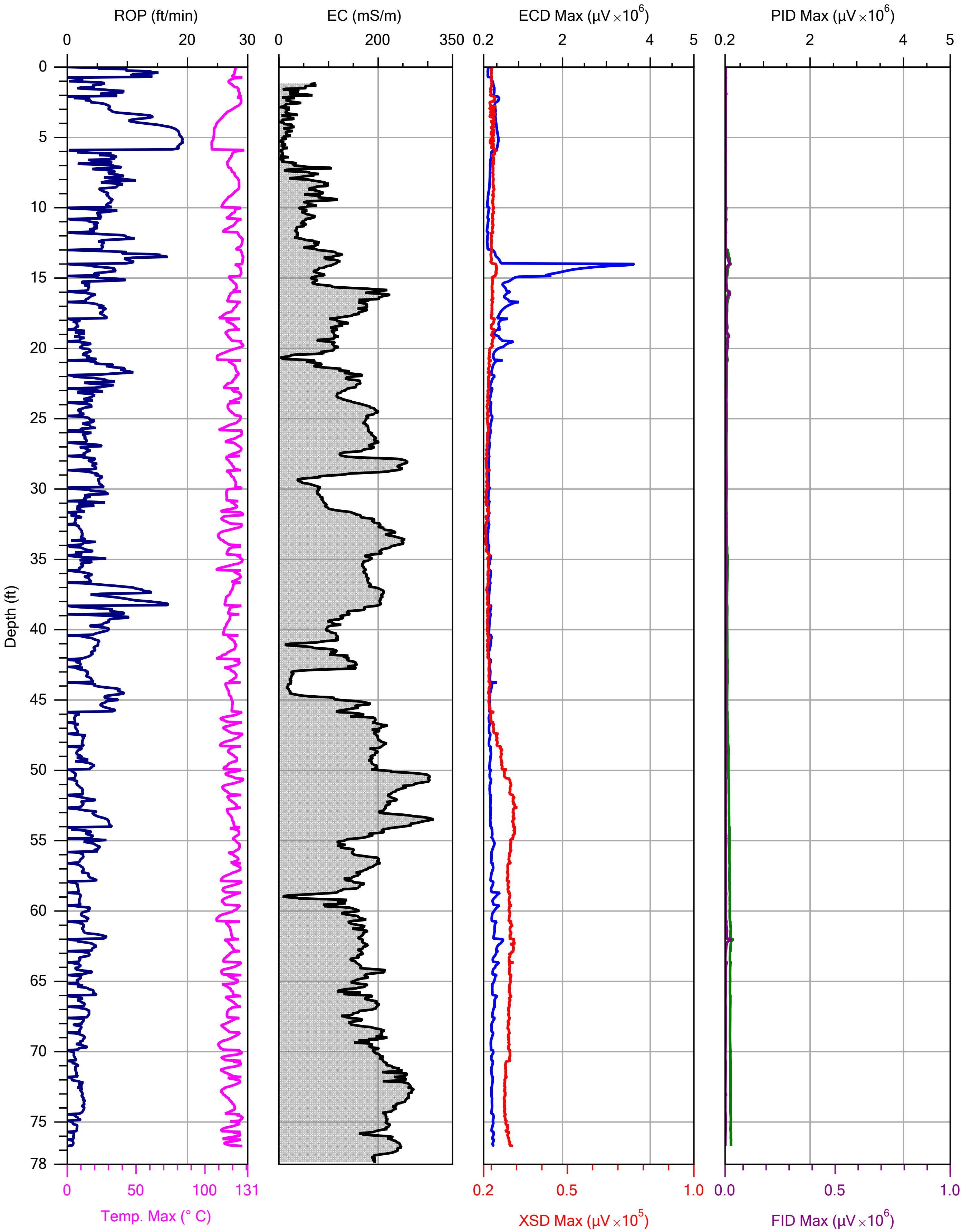
Company: Cascade	Operator: C Terry	Date: 07/28/21
Project ID: Omega OU1	Client: CDM Smith	Location: Whittier, CA



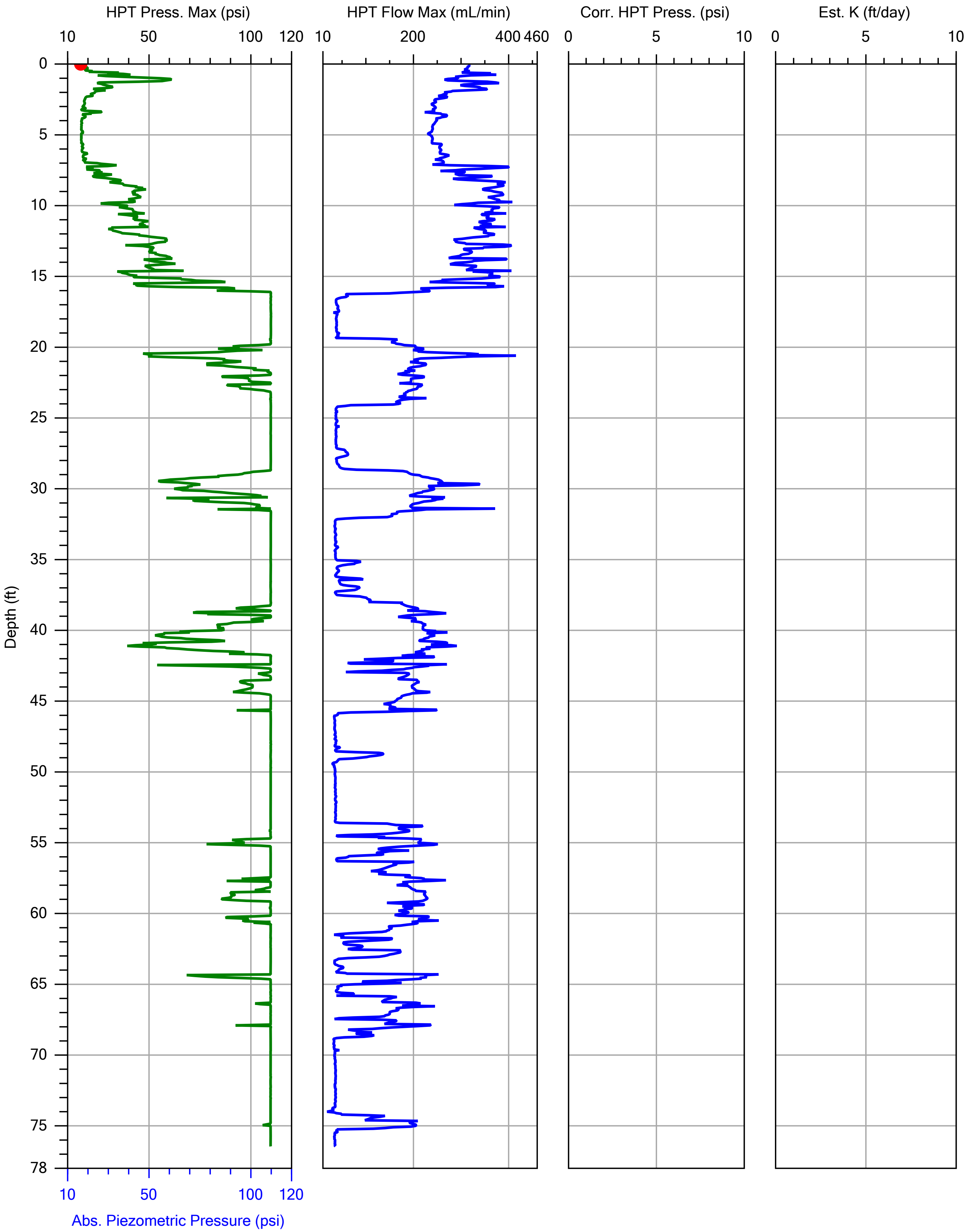
CASCADE
DRILLING | TECHNICAL SERVICES

		File: SB-2104.MHP
Company: Cascade	Operator: C Terry	Date: 07/28/21
Project ID: Omega OU1	Client: CDM Smith	Location: Whittier, CA



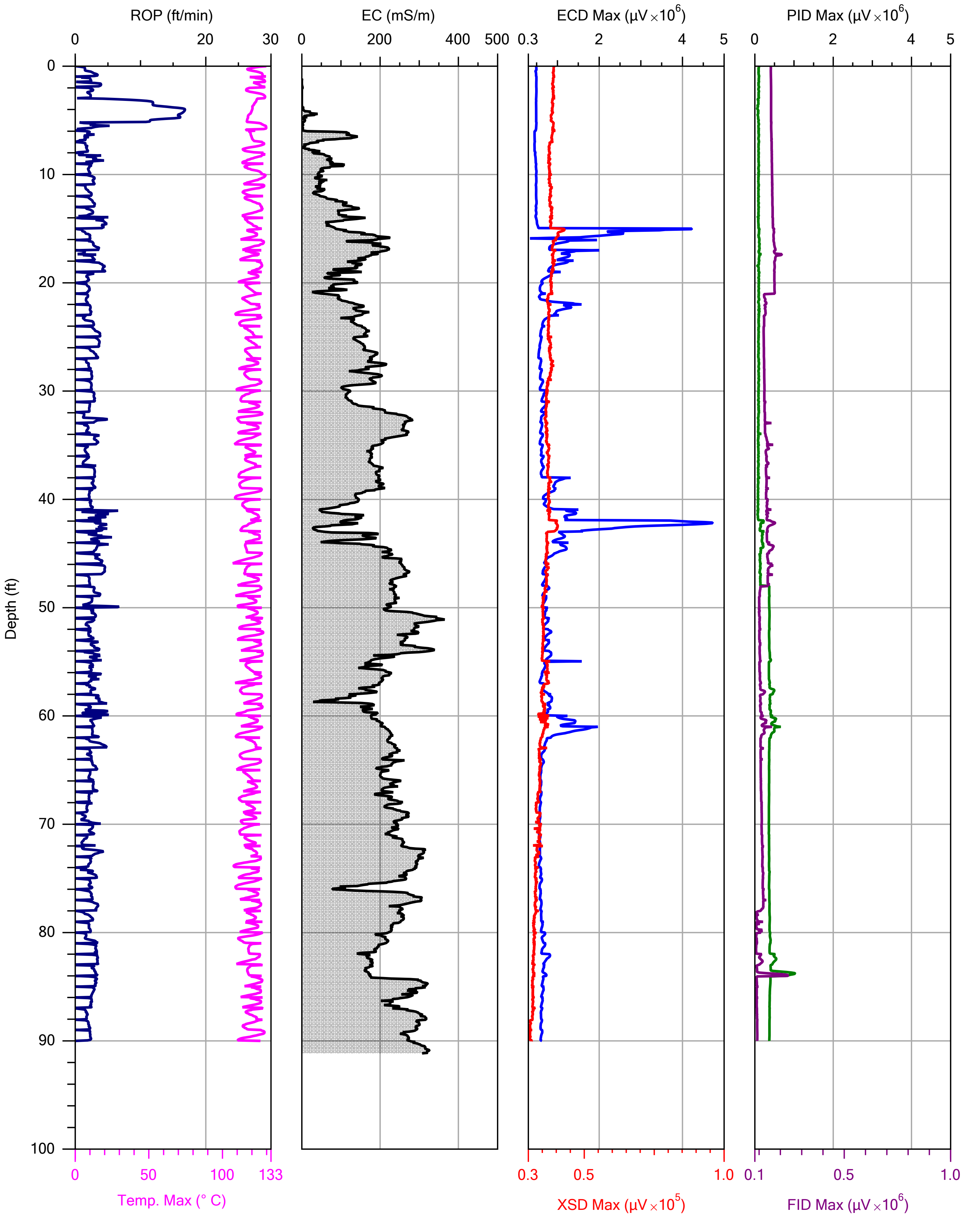
CASCADE
DRILLING | TECHNICAL SERVICES

Company: Cascade	Operator: C Terry	File: SB-2107.MHP
		Date: 9/9/2021
Project ID: Omega OU1	Client: CDM Smith	Location: Whittier, CA



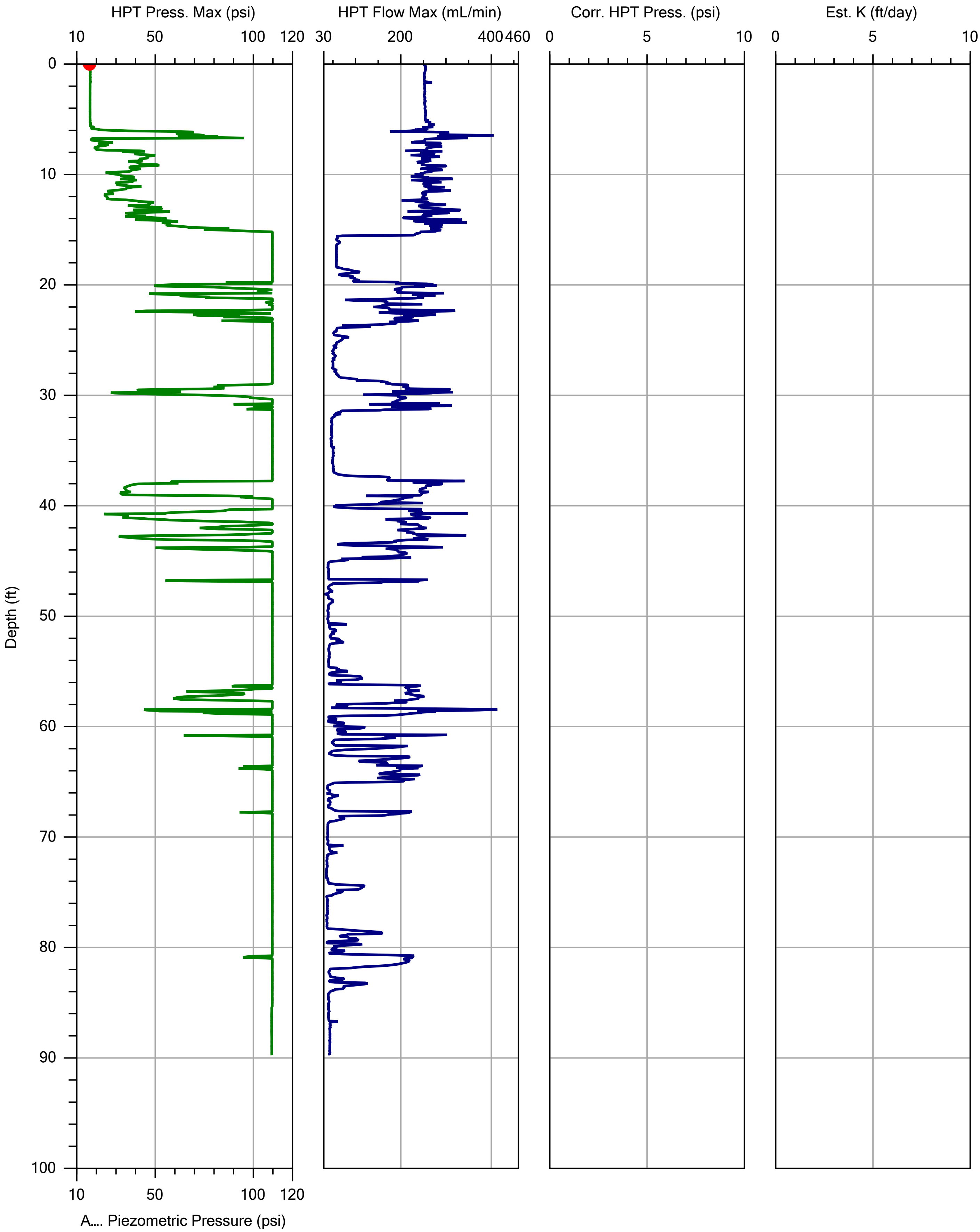
CASCADE DRILLING | TECHNICAL SERVICES

		File: SB-2107.MHP
Company: Cascade	Operator: C Terry	Date: 9/9/2021
Project ID: Omega OU1	Client: CDM Smith	Location: Whittier, CA



CASCADE
DRILLING | TECHNICAL SERVICES

		File: SB-2108.MHP
Company: Cascade	Operator: C Terry	Date: 08/17/21
Project ID: Omega OU1	Client: CDM Smith	Location: Whittier, CA



CASCADE
DRILLING | TECHNICAL SERVICES

		File: SB-2108.MHP
Company: Cascade	Operator: C Terry	Date: 08/17/21
Project ID: Omega OU1	Client: CDM Smith	Location: Whittier, CA

ATTACHMENT 2
SOIL BORING LITHOLOGIC LOGS

111 Academy, Suite 150
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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
LOCATION 12511 Putnam Street
DRILLING METHOD Hollow Stem Auger
SAMPLING METHOD Split Spoon
GROUND ELEVATION (FT MSL)
TOP OF CASING (FT MSL)
LOGGED BY Leslie Dybel
REMARKS

BORING/WELL NUMBER SB-2101
DATE DRILLED September 16, 2021
CASING TYPE/DIAMETER
SCREEN TYPE/SLOT
GRAVEL PACK TYPE
GROUT TYPE/QUANTITY
DEPTH TO WATER (FT BGS)
GROUND WATER ELEVATION (FT MSL)

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						ML		Hand auger to 10 ft bgs.		
0	- -	0.5			5			SANDY SILT: Light medium brown, dry, 70% silt, 30% sand, poorly graded, fine to coarse, subangular.		
0	4,5,7	1.5			10			Same as above, soft.		
0	6,8,10	1			15			SANDY SILT: Dark brown, dry, 55% silt, 30% sand, poorly graded, fine to coarse, 5% gravel, poorly graded, 0.2", subangular.		
0	5,8,11	1.5			20			Same as above, broken rock at 20'.		
0.1	9,12,14	1.5			25			SANDY SILT: Medium brown, dry, 70% silt, 30% sand, poorly graded, fine to coarse.		
					30					

Continued Next Page

NEWGINT OPOG_GINT_CORRECT.GPJ LAEWNN01.GDT 10/6/21

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.1	8,10,14	1.5				ML		Same as above.		
0.5	9,13,15	1.5			35			Same as above.		
0.1	10,12,16	1.5			40			Same as above.		
0.1	- -	1.5			45			Same as above.		
0	8,12,16	1.5			50			SANDY SILT: Medium brown, dry, 60% silt, 40% sand, poorly graded, fine.		
0	5,8,12	1.5			55			SILT: Light yellow brown, dry, 100% silt, soft.		
0.2	7,13,15	1.5			60			SANDY SILT: Light grayish tan, dry, 60% silt, 40% sand, poorly graded, fine.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
BORING/WELL NUMBER SB-2101
PROJECT NAME Omega OU1
DATE DRILLED September 16, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.9	12,13,17	1			65	SP		SAND: Light grayish tan, dry, 100% sand, poorly graded, fine.	65.0	
0	9,15,17	1			70			SAND: Light yellowish brown, dry, 100% sand, poorly graded, fine.		
0.2	11,16,19	1.5			75	CL		CLAY: Light yellowish brown, dry, 100% clay, hard.	75.0	
0.2	14,19,20	1.5			80	ML		SILT: Medium yellow brown, dry, 90% silt, 10% sand, cream and gray mottling.	80.0	
0	15,18,21	1.5			85			SILT WITH SAND: Medium reddish brown, dry, 75% silt, 20% sand, poorly graded, fine to medium, subrounded, 5% gravel, poorly graded, fine, up to 0.3", subrounded, cream mottling and sand stringer at 86'.		
								SILT WITH SAND: Medium brown, dry, 80% silt, 20% sand, poorly graded, fine to coarse, subrounded.		
0.2	14,19,23	1.5			90			Total Depth = 90 ft bgs	90.0	

NEWGINT OPOG_GINT_CORRECT.GPJ LAEWNN01.GDT 10/6/21

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	258815	**BORING/WELL NUMBER**	SB-2102
PROJECT NAME	Omega OU1	**DATE DRILLED**	September 14, 2021
LOCATION	12511 Putnam Street	**CASING TYPE/DIAMETER**	
DRILLING METHOD	Hollow Stem Auger	**SCREEN TYPE/SLOT**	
SAMPLING METHOD	Split Spoon	**GRAVEL PACK TYPE**	
GROUND ELEVATION (FT MSL)		**GROUT TYPE/QUANTITY**	
TOP OF CASING (FT MSL)		**DEPTH TO WATER (FT BGS)**	
LOGGED BY	Leslie Dybel	**GROUND WATER ELEVATION (FT MSL)**	
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						ML		Hand auger to 10 ft bgs.		
0	- -	0.5			5			SANDY SILT: Light medium brown, dry, 70% silt, 30% sand, poorly graded, fine to coarse, subangular, roots.		
0	8,11,13	1.5			10			Same as above, 10% cream mottling.		
0.2	12,15,19	1			15			SILT WITH SAND: Medium brown, dry, 70% silt, 20% sand, poorly graded, fine to coarse, mostly fine to emdium, 10% clay, hard, roots.		
0.2	10,16,19	1.5			20			SANDY SILT: Medium brown, dry, 60% silt, 30% sand, poorly graded, fine to coarse, 10% gravel, poorly graded, fine, subangular.		
0.4	11,14,19	1.5			25			SILT WITH SAND: Medium brown, dry, 80% silt, 20% sand.		
					30					

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815 **BORING/WELL NUMBER** SB-2102
PROJECT NAME Omega OU1 **DATE DRILLED** September 14, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.1	10,13,16	1.5				ML		Same as above.		
0.3	13,18,20	1.5			35			Same as above.		
0.3	11,16,19	1.5			40			SANDY SILT WITH GRAVEL: Medium brown, dry, 50% silt, 30% sand, poorly graded, fine to medium, 20% gravel, poorly graded, fine.		
0.3	14,16,19	1.5			45			SILT WITH SAND: Medium brown, dry, 80% silt, 20% sand.		
0.4	16,18,21	1.5			50			Same as above.		
0.2	9,14,20	1.5			55			SANDY SILT: Light yellow brown, dry, 60% silt, 40% sand, poorly graded, fine.		
0.3	10,14,18	1.5			60			Same as above.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815 **BORING/WELL NUMBER** SB-2102

PROJECT NAME Omega OU1 **DATE DRILLED** September 14, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.6	12,15,19	1			65	SP		SAND: Light brown, dry, 100% sand, poorly graded, fine.	65.0	
0	9,10,15	1.5			70			SAND: Light brown, dry, 100% sand, poorly graded, fine to coarse, mostly fine to medium.		
0	12,16,20	1.5			75	ML		SILT: Light brown, dry, 90% silt, 10% sand, poorly graded, fine to coarse, gray and cream mottling.	75.0	
0.6	10,15,18	1.5			80			SILT WITH SAND: Light brown, dry, 75% silt, 20% sand, poorly graded, fine to medium, 5% gravel, poorly graded, mostly fine but up to 1.5".		
0.2	11,13,19	1			85	SP SM		SAND WITH SILT AND GRAVEL: Light brown, dry, 50% sand, well graded, fine to coarse, 40% gravel, poorly graded, up to 1.5", 10% silt.	85.0	
0	7,12,16	1.5			90	GP GM		GRAVEL WITH SILT AND SAND: Light brown, slightly moist, 50% gravel, poorly graded, up to 1.5", 40% sand, well graded, fine to coarse, 10% silt.	89.0	
	13,17,20,25	2				ML		SILT: Light brown, slightly moist, 90% silt, 10% sand, some gray mottling.	93.0	
	14,17,22	1.5			95			SILT: Light brown, moist, 90% silt, 10% sand, poorly graded, fine, occasional fine gravel, poorly graded, subangular.		
	13,15,19,22	2						SILT: Dark brown, moist, 80% silt, 20% clay, hard.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815 **BORING/WELL NUMBER** SB-2102

PROJECT NAME Omega OU1 **DATE DRILLED** September 14, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					100	ML				
	14,18,21	1.5			105			SILT WITH SAND: Dark brown, moist, 50% silt, 20% clay, 20% sand, poorly graded, fine to coarse, subangular, 10% gravel, poorly graded, fine, subangular, hard.		
	11,14,20,21	2						SANDY SILT WITH GRAVEL: Medium brown, moist, 40% silt, 30% sand, well graded, fine to coarse, subangular, 20% gravel, poorly graded, fine, subangular, 10% clay.	108.5	
								Total Depth = 108.5 ft bgs		

NEWGINT OPOG_GINT_CORRECT.GPJ LAEWNN01.GDT 10/6/21

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	258815	**BORING/WELL NUMBER**	SB-2103/VE45D
PROJECT NAME	Omega OU1	**DATE DRILLED**	September 15, 2021
LOCATION	12511 Putnam Street	**CASING TYPE/DIAMETER**	Schedule 40 PVC 4"
DRILLING METHOD	Hollow Stem Auger	**SCREEN TYPE/SLOT**	0.02 Factory Slotted
SAMPLING METHOD	Split Spoon	**GRAVEL PACK TYPE**	#3 Monterey Sand
GROUND ELEVATION (FT MSL)		**GROUT TYPE/QUANTITY**	Portland Cement
TOP OF CASING (FT MSL)		**DEPTH TO WATER (FT BGS)**	
LOGGED BY	Leslie Dybel	**GROUND WATER ELEVATION (FT MSL)**	
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					0	ML		Hand auger to 10 ft bgs.		Traffic Rated Cover
0		0.5			5			SANDY SILT: Light medium brown, dry, 70% silt, 30% sand, poorly graded, fine to coarse, subangular, 10% cream mottling.		
-	- -	0			10					4" diam. schedule 40 PVC Blank Casing (0-45' bgs)
0	6,9,11	1.5						SANDY SILT WITH GRAVEL: Dark brown, dry, 50% silt, 30% sand, poorly graded, fine to coarse, 20% gravel, 2' rock.		
0	8,10,15	1.5			15			SILT WITH SAND: Dark brown, dry, 75% silt, 20% sand, porrly graded, fine, 5% gravel, poorly graded, 0.3" grain size, subangular, hard.		
0	9,13,15	1.5			20			SILT WITH SAND: Medium brown, dry, 80% silt, 20% sand, poorly graded, fine, gravel-white rock at 21'.		Portland Cement/Bentonite Grout (2-39' bgs)
0	11,14,17	1.5			25			SILT WITH SAND: Medium brown, dry, 75% silt, 20% sand, poorly graded, fine, 5% gravel, poorly graded, 0.2", subangular.		
					30					

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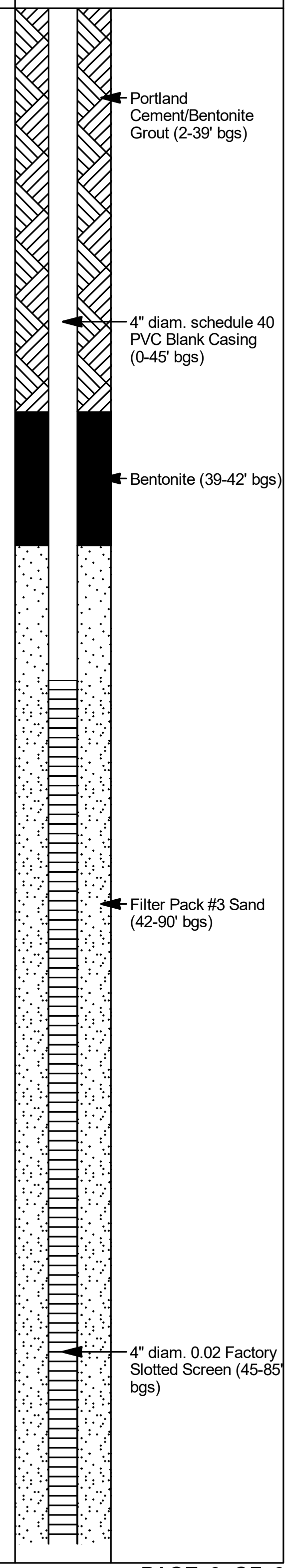
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2103/VE45D
DATE DRILLED September 15, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.2	10,14,17	1.5				ML		SILT: Medium brown, dry, 90% silt, 10% sand, poorly graded, fine to coarse.	
0.6	12,15,19	1.5			35			SILT: Medium brown, dry, 80% silt, 10% clay, 10% sand, poorly graded, fine, harder than above.	
0.2	13,16,20	1.5			40			SANDY SILT WITH GRAVEL: Medium brown, dry, 50% silt, 30% sand, poorly graded, fine to medium, 20% gravel, poorly graded, up to 1", fine.	
0.5	13,13,19	1.5			45			SILT WITH SAND: Medium brown, dry, 80% silt, 20% sand, poorly graded, fine to medium.	
0.5	10,16,21	1.5			50			SILT WITH SAND: Medium brown, dry, 80% silt, 20% sand, poorly graded, fine to coarse, hard.	
0.5	7,12,16	1.5			55			SANDY SILT: Light yellow brown, dry, 60% silt, 40% sand, poorly graded, fine.	
0.3	8,7,15	1.5			60			Same as above.	

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2103/VE45D
DATE DRILLED September 15, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.2	8,14,19	1.5			65	SM		SILTY SAND: Light brown, dry, 70% sand, poorly graded, fine to coarse, mostly fine, 30% silt.	65.0	
0.4	8,10,14	0.5			70			Same as above.		Filter Pack #3 Sand (42-90' bgs)
0.2	8,12,15	1.5			75	ML		SILT: Medium reddish brown, dry, 80% silt, 10% clay, 10% sand, poorly graded, fine to medium, gray and cream mottling, hard, occasional gravel 0.2".	75.0	
0.4	11,14,15	1			80			SANDY SILT WITH GRAVEL: Reddish brown, dry, 50% silt, 30% sand, poorly graded, fine to coarse, 20% gravel, poorly graded, fine, up to 1", subrounded.		4" diam. 0.02 Factory Slotted Screen (45-85' bgs)
0.2	14,19,21	1.5			85			SILT: Medium brown, dry, 90% silt, 10% sand, poorly graded, fine, reddish brown and cream mottling, hard.		
								Same as above with gray mottling.		
0.1	10,14,18	1.5			90			Total Depth = 90 ft bgs	90.0	

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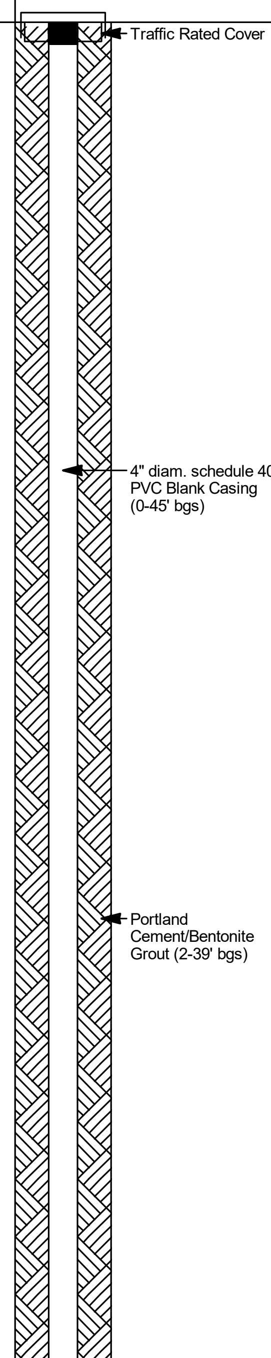
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	258815	**BORING/WELL NUMBER**	SB-2104/VE-46D
PROJECT NAME	Omega OU1	**DATE DRILLED**	August 3, 2021
LOCATION	12511 Putnam Street	**CASING TYPE/DIAMETER**	Schedule 40 PVC 4"
DRILLING METHOD	Hollow Stem Auger	**SCREEN TYPE/SLOT**	0.02 Factory Slotted
SAMPLING METHOD	Split Spoon	**GRAVEL PACK TYPE**	#3 Monterey Sand
GROUND ELEVATION (FT MSL)		**GROUT TYPE/QUANTITY**	Portland Cement
TOP OF CASING (FT MSL)		**DEPTH TO WATER (FT BGS)**	
LOGGED BY	Leslie Dybel	**GROUND WATER ELEVATION (FT MSL)**	
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
					0			Hand auger to 10 ft bgs.	
0.1		0.5			5			SILT WITH SAND: Medium brown, dry, 85% silt, 15% sand, poorly graded, fine to medium, subangular.	
0.2	5,9,13	1.5			10			SILT WITH SAND: Medium brown, dry, 75% silt, 15% sand, poorly graded, fine to coarse, subangular, 10% gravel, poorly graded, fine to coarse up to 1", subangular.	
0.4	11,15,18	1.5			15			SILT WITH SAND (one broken white 1" rock): Dark medium brown, dry, 85% silt, 15% sand, poorly graded, fine to medium, subangular.	
0.2	12,14,22	1.5						SANDY SILT WITH GRAVEL: Dark medium brown, dry, 70% silt, 15% sand, poorly graded, fine to medium, subangular, 15% gravel, 0.5"-1" pieces, subangular.	
0.4	8,13,17	1.5			20			SILT WITH SAND: Dark medium brown, dry, 85% silt, 15% sand, poorly graded, fine to medium (occasionally coarse), subangular.	
0.3	11,15,17	1.5			25			Same as above.	
						ML			
					30				

WELL DIAGRAM



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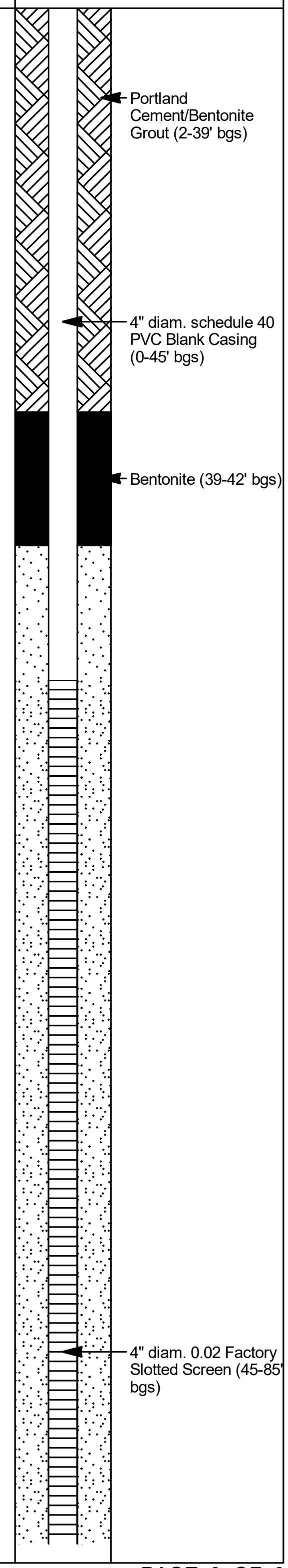
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815 **BORING/WELL NUMBER** SB-2104/VE-46D
PROJECT NAME Omega OU1 **DATE DRILLED** August 3, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.3	13,19,24	1.5				ML		SILT WITH SAND: Dark medium brown, dry, 65% silt, 20% clay, 15% sand, poorly graded, fine to medium (occasionally coarse), subangular.	
0.3	14,17,20	1.5			35	ML		As above.	
0.1	6,8,10	1.5			40	ML		Same as above with occasional cream colored mottling	
0.1	7,8,11	1.5			45	ML		As above.	
0.1	10,15,20	1.5			50	ML		SILT: Dark medium brown with cream-colored mottling, dry, 90% silt, 10% sand, poorly graded, fine.	
0.2	9,14,19	1.3				ML		SILT WITH SAND: Medium brown, dry, soft, 75% silt, 25% sand, poorly graded, fine.	55.0
0.5	9,13,18	1			55	SM		SILTY SAND: Medium brown, dry, 50% silt, 50% sand, poorly graded, fine.	60.0
0.3	11,16,19	1			60	SP		SAND: Light gray brown, dry, 95% sand, poorly graded, fine to coarse (mostly fine to medium), 5% gravel, poorly graded, fine, subangular, occasional clay nodules.	

WELL DIAGRAM



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NEWGINT OPOG_GINT_CORRECT.GPJ LAEWNN01.GDT 10/6/21

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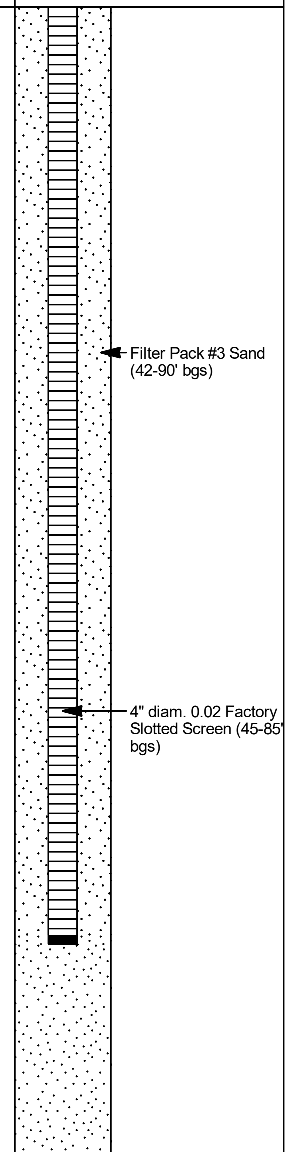
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
BORING/WELL NUMBER SB-2104/VE-46D
PROJECT NAME Omega OU1
DATE DRILLED August 3, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.3	12,16,22	1			65	SP		As above	
0.2	9,15,19	1			70			CLAYEY SILT: Medium brown, 70% silt, 30% clay, occasional medium sand, 10% cream-colored mottling, hard.	70.0
0.6	18,19,22	1			75			Same as above but with gray and cream-colored mottling, softer than above.	
0.4	10,15,24	0.5			80	ML		As above.	
0.3	12,17,19	0.3			85			As above with occasional gravel, rounded, up to 0.4 inches.	
								As above.	
0.2	10,5,21	0.3			90			Total Depth = 90 ft bgs	90.0

WELL DIAGRAM



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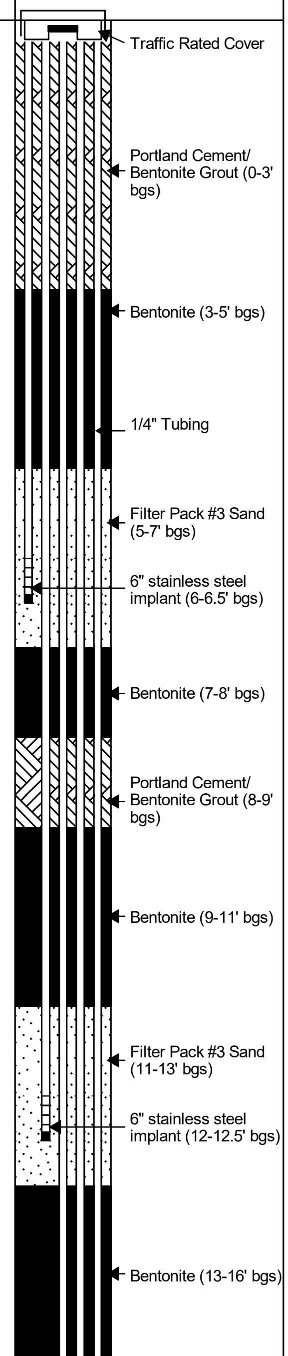
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
LOCATION 12511 Putnam Street
DRILLING METHOD Hollow Stem Auger
SAMPLING METHOD Split Spoon
GROUND ELEVATION (FT MSL)
TOP OF CASING (FT MSL)
LOGGED BY Leslie Dybel
REMARKS Multi-Depth Vapor Monitoring Probe (VMP) with probes at 6, 12, 24, 40, 50, 60, 70 and 80 ft.

BORING/WELL NUMBER SB-2105/VMP-117A
DATE DRILLED September 8-9, 2021
CASING TYPE/DIAMETER 1/4" O.D. Teflon Tubing
SCREEN TYPE/SLOT 6" Stainless Steel Mesh Screen
GRAVEL PACK TYPE #3 Monterey Sand
GROUT TYPE/QUANTITY Portland Cement with 5% Bentonite
DEPTH TO WATER (FT BGS) Not encountered
GROUND WATER ELEVATION (FT MSL)

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
					0			Hand auger to 10 ft bgs.	
0	- -	0.5			5	ML		SANDY SILT: Medium brown, dry, 50% silt, 30% sand, poorly graded, fine to coarse, mostly fine, subangular, 15% clay, 5% gravel, poorly graded, fine, subangular.	
0	8,10,12	1			10	SM		SILT SAND WITH GRAVEL: Medium brown, dry, 50% sand, poorly graded, fine to coarse, subangular, 30% silt, 20% gravel, poorly graded, coarse, subrounded to subangular, white rock/gravel.	10.0
					15				15.0

WELL DIAGRAM



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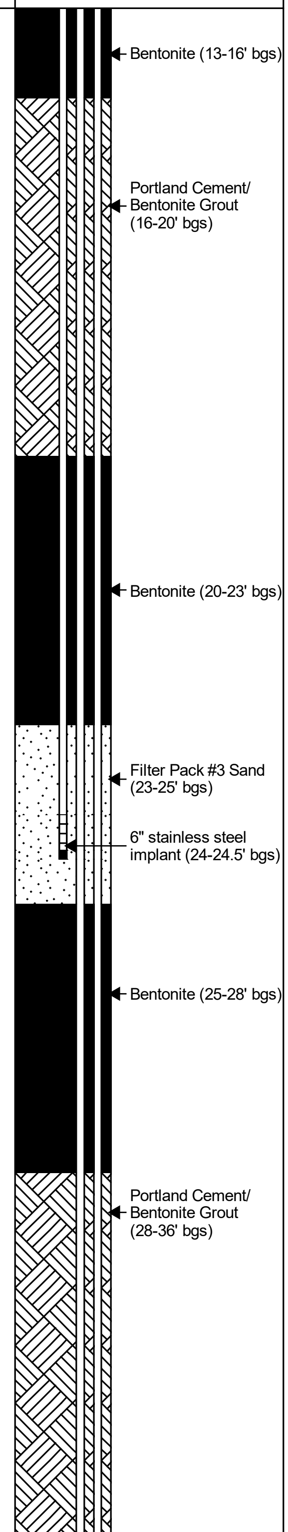
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2105/VMP-117A
DATE DRILLED September 8-9, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0	9,11,14	1						SANDY SILT: Medium brown, dry, 60% silt, 30% sand, poorly graded, fine to very coarse, subangular, 10% gravel, white rock with mottles.	
0	10,12,13	1.5			20			SILT WITH SAND: Medium brown, dry, 80% silt, 20% sand, poorly graded, fine to coarse, mostly fine, subangular.	
						ML			
0	12,13,16	1.5			25			Same as above, fine to medium.	
0	12,14,16	1.5			30			Same as above.	

WELL DIAGRAM



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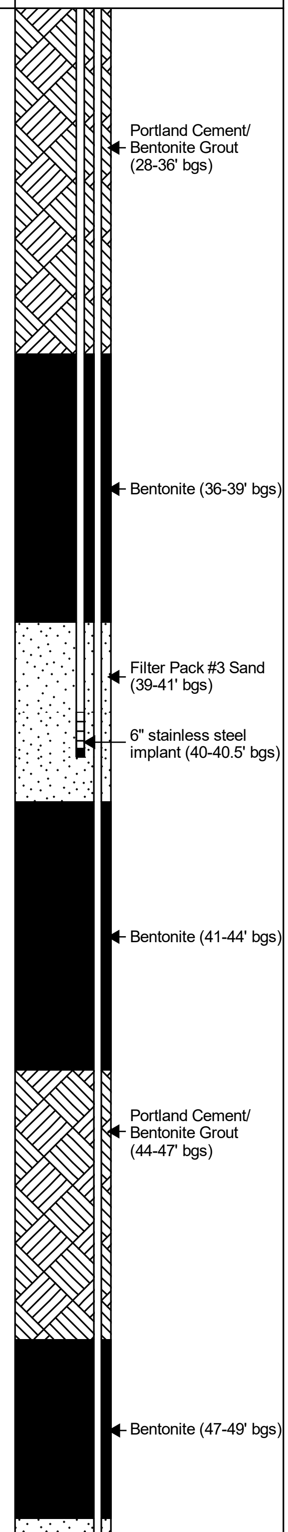
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2105/VMP-117A
DATE DRILLED September 8-9, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0	15,17,19	1.5			35	ML		SILT: Medium brown, dry, 70% silt, 20% clay, 10% sand, poorly graded, fine to medium.	
0	13,15,17	1.5			40			SILT WITH SAND: Medium brown, dry, 70% silt, 20% sand, poorly graded, fine to medium, 10% clay, softer.	
0	12,15,19	1.5			45			SILT: Medium brown, dry, 70% silt, 20% clay, 10% sand, poorly graded, fine to medium.	

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815 **BORING/WELL NUMBER** SB-2105/VMP-117A
PROJECT NAME Omega OU1 **DATE DRILLED** September 8-9, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.1	13,15,18	1.5			50	ML		CLAYEY SILT: Dark brown, dry, 60% silt, 30% clay, 10% sand, poorly graded, fine to coarse, hard.		Filter Pack #3 Sand (49-51' bgs); 6" stainless steel implant (50-50.5' bgs)
0	15,18,19	1.5			55			SILTY SAND: Light brown, dry, 60% sand, poorly graded, fine to medium, 40% silt.	55.0	See Log SB-2105B for construction details for the 60, 70, and 80 ft. probes
0	8,10,12	1.5			60	SM		SILTY SAND: Light brown, dry, 80% sand, poorly graded, fine to medium, 20% silt.		
0	9,11,12	1.5			65			SANDY SILT: Light brown, dry, 60% silt, 40% sand, poorly graded, fine, micaceous.	65.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815 **BORING/WELL NUMBER** SB-2105/VMP-117A
PROJECT NAME Omega OU1 **DATE DRILLED** September 8-9, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0	15,18,21	1.5			70			SILT WITH SAND: Dark brown, dry, 60% silt, 20% clay, 20% sand, poorly grade, fine but occasionally coarse, hard, white mottles.		See Log SB-2105B for construction details for the 60, 70, and 80 ft. probes
0.1	14,15,16	1.5			75	ML		SANDY SILT: Medium brown, dry, 60% silt, 30% sand, poorly graded, fine to medium, 10% clay, white mottles.		
0	14,16,17	1.5			80			As above with white mottles, no clay, 70% silt, 30% sand.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2105/VMP-117A
DATE DRILLED September 8-9, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.1	15,15,18	1.5			85	ML		SANDY SILT: Reddish brown, 60% silt, 30% sand, 10% gravel, poorly graded, up to 1.5", subrounded, hard, white rock up to 1.5".		
						SM		SILTY SAND WITH GRAVEL: Reddish brown, slightly moist, 50% silt, 30% sand, poorly graded, fine to coarse, mostly medium, subangular, 20% gravel, poorly graded, up to 1", subrounded, softer.	89.0	See Log SB-2105B for construction details for the 60, 70, and 80 ft. probes
0	13,16,19	1.5			90			Total Depth = 90 ft bgs	90.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
LOCATION 12511 Putnam Street
DRILLING METHOD Hollow Stem Auger
SAMPLING METHOD Split Spoon
GROUND ELEVATION (FT MSL)
TOP OF CASING (FT MSL)
LOGGED BY Leslie Dybel
REMARKS Multi-Depth Vapor Monitoring Probe (VMP) with probes at 6, 12, 24, 40, 50, 60, 70 and 80 ft.

BORING/WELL NUMBER SB-2105/VMP-117B
DATE DRILLED September 8-9, 2021
CASING TYPE/DIAMETER 1/4" O.D. Teflon Tubing
SCREEN TYPE/SLOT 6" Stainless Steel Mesh Screen
GRAVEL PACK TYPE #3 Monterey Sand
GROUT TYPE/QUANTITY Portland Cement with 5% Bentonite
DEPTH TO WATER (FT BGS)
GROUND WATER ELEVATION (FT MSL)

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
								Hand auger to 10 ft bgs.		
-	- -	0.5			5	ML		SANDY SILT: Medium brown, dry, 50% silt, 30% sand, poorly graded, fine to coarse, mostly fine, subangular, 15% clay, 5% gravel, poorly graded, fine, subangular.		See Log SB-2105A for construction details for the 6, 12, 24, 40, and 50 ft. probes
-	8,10,12	1			10	SM		SILT SAND WITH GRAVEL: Medium brown, dry, 50% sand, poorly graded, fine to coarse, subangular, 30% silt, 20% gravel, poorly graded, coarse, subrounded to subangular, white rock/gravel.	10.0	
					15				15.0	

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815 **BORING/WELL NUMBER** SB-2105/VMP-117B

PROJECT NAME Omega OU1 **DATE DRILLED** September 8-9, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
-	9,11,14	1				ML		SANDY SILT: Medium brown, dry, 60% silt, 30% sand, poorly graded, fine to very coarse, subangular, 10% gravel, white rock with mottles.		
0	10,12,13	1.5			20			SILT WITH SAND: Medium brown, dry, 80% silt, 20% sand, poorly graded, fine to coarse, mostly fine, subangular.		
0	12,13,16	1.5			25			Same as above, fine to medium.		See Log SB-2105A for construction details for the 6, 12, 24, 40, and 50 ft. probes
0	12,14,16	1.5			30			Same as above.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2105/VMP-117B
DATE DRILLED September 8-9, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0	15,17,19	1.5			35	ML		SILT: Medium brown, dry, 70% silt, 20% clay, 10% sand, poorly graded, fine to medium.		
0	13,15,17	1.5			40			SILT WITH SAND: Medium brown, dry, 70% silt, 20% sand, poorly graded, fine to medium, 10% clay, softer.		See Log SB-2105A for construction details for the 6, 12, 24, 40, and 50 ft. probes
0	12,15,19	1.5			45			SILT: Medium brown, dry, 70% silt, 20% clay, 10% sand, poorly graded, fine to medium.		

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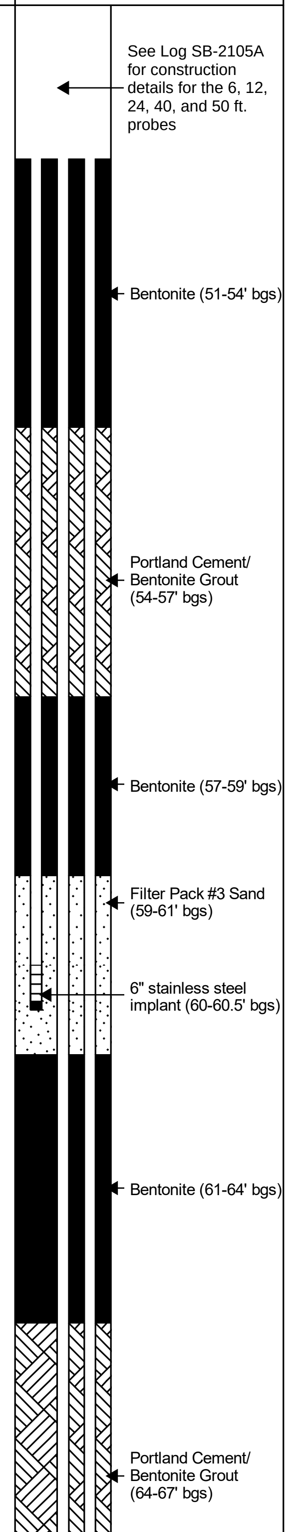
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2105/VMP-117B
DATE DRILLED September 8-9, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.1	13,15,18	1.5			50	ML		CLAYEY SILT: Dark brown, dry, 60% silt, 30% clay, 10% sand, poorly graded, fine to coarse, hard.	
0	15,18,19	1.5			55	SM		SILTY SAND: Light brown, dry, 60% sand, poorly graded, fine to medium, 40% silt.	55.0
0	8,10,12	1.5			60			SILTY SAND: Light brown, dry, 80% sand, poorly graded, fine to medium, 20% silt.	
0	9,11,12	1.5			65	ML		SANDY SILT: Light brown, dry, 60% silt, 40% sand, poorly graded, fine, micaceous.	65.0

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2105/VMP-117B
DATE DRILLED September 8-9, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
										Portland Cement/ Bentonite Grout (64-67' bgs)
										Bentonite (67-69' bgs)
										Filter Pack #3 Sand (69-71' bgs)
0	15,18,21	1.5			70			SILT WITH SAND: Dark brown, dry, 60% silt, 20% clay, 20% sand, poorly grade, fine but occasionally coarse, hard, white mottles.		6" stainless steel implant 70-70.5' bgs)
										Bentonite (71-74' bgs)
0.1	14,15,16	1.5			75			SANDY SILT: Medium brown, dry, 60% silt, 30% sand, poorly graded, fine to medium, 10% clay, white mottles.		Portland Cement/ Bentonite Grout (74-77' bgs)
						ML				
										Bentonite (77-79' bgs)
										Filter Pack #3 Sand (79-81' bgs)
0	14,16,17	1.5			80			As above with white mottles, no clay, 70% silt, 30% sand.		6" stainless steel implant 80-80.5' bgs)
										Bentonite (81-84' bgs)

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PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2105/VMP-117B
DATE DRILLED September 8-9, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
										Bentonite (81-84' bgs)
0.1	15,15,18	1.5			85	ML		SANDY SILT: Reddish brown, 60% silt, 30% sand, 10% gravel, poorly graded, up to 1.5", subrounded, hard, white rock up to 1.5".		Portland Cement/ Bentonite Grout (84-90' bgs)
						SM		SILTY SAND WITH GRAVEL: Reddish brown, slightly moist, 50% silt, 30% sand, poorly graded, fine to coarse, mostly medium, subangular, 20% gravel, poorly graded, up to 1", subrounded, softer.	89.0	
0	13,16,19	1.5			90			Total Depth = 90 ft bgs	90.0	

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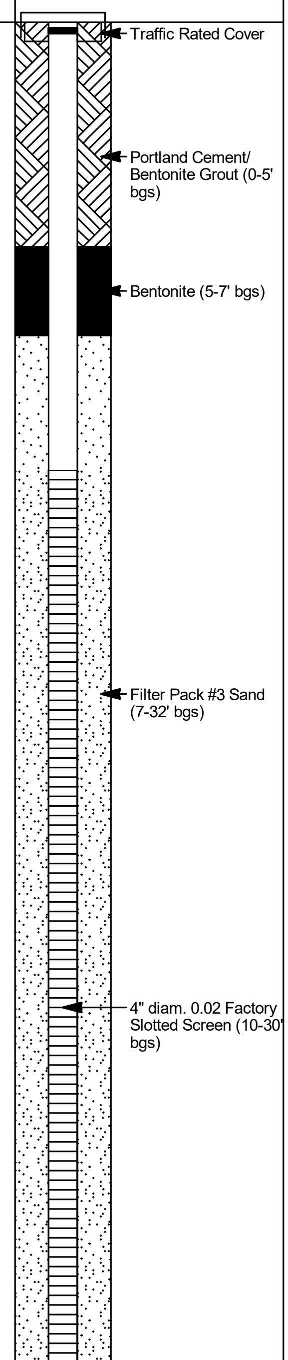
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
LOCATION 12511 Putnam Street
DRILLING METHOD Hollow Stem Auger
SAMPLING METHOD Split Spoon
GROUND ELEVATION (FT MSL)
TOP OF CASING (FT MSL)
LOGGED BY Leslie Dybel
REMARKS

BORING/WELL NUMBER SB-2106/VE-47S
DATE DRILLED September 9-10, 2021
CASING TYPE/DIAMETER Schedule 40 PVC 4"
SCREEN TYPE/SLOT 0.02 Factory Slotted
GRAVEL PACK TYPE #3 Monterey Sand
GROUT TYPE/QUANTITY Portland Cement
DEPTH TO WATER (FT BGS)
GROUND WATER ELEVATION (FT MSL)

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
					0			Hand auger to 5 ft bgs.	
0	- -	0.5			5			SILT WITH SAND: Medium brown, dry, 60% silt, 20% sand, poorly graded, fine to medium, 15% clay, 5% gravel, poorly graded, up to 1", subrounded.	
0.1	50	0.11			10			Poor recovery due to rock.	
						ML			
0	7,10,13	1.5			15			SILT WITH SAND: Medium brown, dry, 70% silt, 20% sand, poorly graded, fine to medium, 10% clay.	
0	5,8,10	1.5			20			SILT WITH SAND: Medium brown, dry, 70% silt, 20% sand, poorly graded, 10% clay.	
0	7,9,12	1.5			25			Same as above, 80% silt, 20% sand.	
					30				

WELL DIAGRAM



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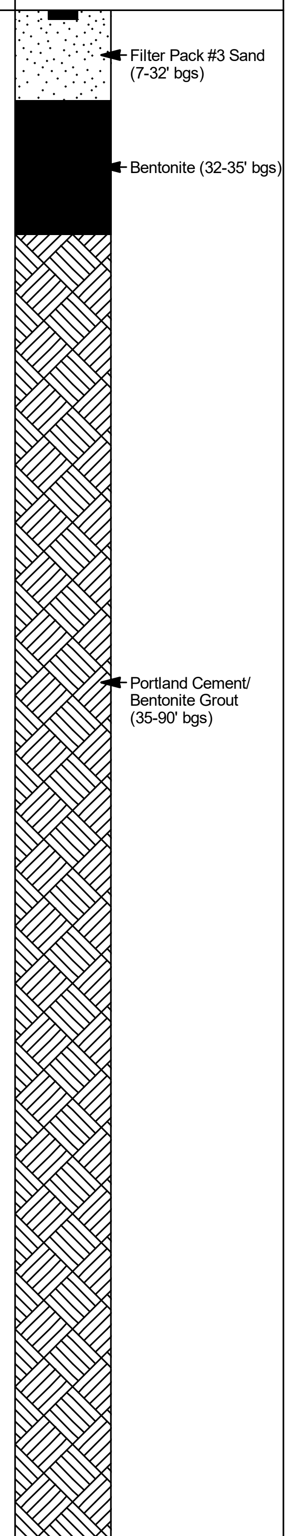
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2106/VE-47S
DATE DRILLED September 9-10, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0	6,9,13	1.5				ML		Same as above, light medium brown.	
0	7,9,14	1.5			35			Same as above with occasional cream-colored burrows.	
0	6,8,10	1.5			40			SILT: Medium brown, dry, 80% silt, 10% clay, 10% sand, poorly graded, fine to coarse, mostly fine to medium, 5% of gravel subrounded up to 0.35", 20% reddish orange mottling.	
0	6,11,14	1.5			45			Same as above with 20% reddish orange mottling.	
0	5,5,12	1.5			50			SILT: Reddish brown, dry, 90% silt, 10% clay, occasional medium sand, hard.	
0	6,8,11	1.5			55			Same as above with 40% cream-colored mottling.	
0	6,9,12	1.5			60	SM		SILTY SAND: Light brown, dry, 60% sand, poorly graded, fine to coarse, mostly fine to medium, subangular, 40% silt, soft, occasional gravel 0.3", rubrounded.	60.0

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2106/VE-47S
DATE DRILLED September 9-10, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0	7,10,11	1.5			65	ML		SILT: Reddish brown, dry, 60% silt, 40% sand, poorly graded, fine to coarse, mostly fine to medium, subangular, 20% cream-gray mottling, soft.	65.0	
0	8,10,11	1.5			70			SILT: Medium brown, dry, 90% silt, 10% clay, 50% gray and reddish brown mottling, soft.		
0	8,10,12	1.5			75			SILT: Medium brown, dry, 80% silt, 10% clay, 10% gravel, poorly graded, up to 0.4", subrounded.		Portland Cement/ Bentonite Grout (35-90' bgs)
0	9,10,10	1.5			80			SILT: Medium brown, dry, 80% silt, 20% clay, 30% cream-colored mottling.		
0	11,13,15	1.5			85			SANDY SILT: Medium brown, dry, 50% silt, 30% sand, poorly graded, fine to coarse, subangular, 20% gravel, poorly graded, up to 0.4", subrounded.		
0	10,11,15	1.5			90			SILT: Dark brown, dry, 80% silt, 10% clay, 10% sand, poorly graded, fine to coarse, subangular, 20% white mottling, hard.	90.0	
								Total Depth = 90 ft bgs		

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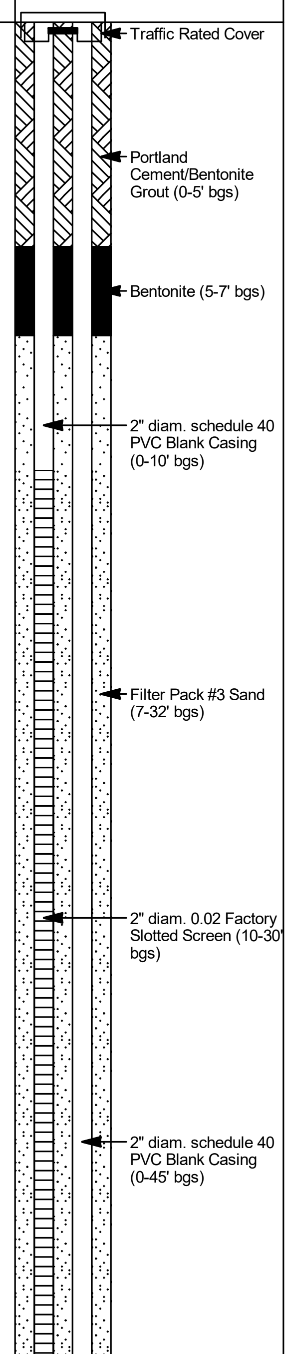
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	258815	**BORING/WELL NUMBER**	SB-2107/VE-48S/D
PROJECT NAME	Omega OU1	**DATE DRILLED**	September 10 and 13, 2021
LOCATION	12511 Putnam Street	**CASING TYPE/DIAMETER**	Schedule 40 PVC 2"
DRILLING METHOD	Hollow Stem Auger	**SCREEN TYPE/SLOT**	0.02 Factory Slotted
SAMPLING METHOD	Split Spoon	**GRAVEL PACK TYPE**	#3 Monterey Sand
GROUND ELEVATION (FT MSL)		**GROUT TYPE/QUANTITY**	Portland Cement
TOP OF CASING (FT MSL)		**DEPTH TO WATER (FT BGS)**	
LOGGED BY	Leslie Dybel	**GROUND WATER ELEVATION (FT MSL)**	
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
								Hand Auger to 10 ft bgs.	
0	- -	0.5			5			SILT WITH SAND: Medium brown, dry, 60% silt, 20% clay, 20% sand, poorly graded, fine to coarse.	
0	4,5,6	1			10			SILT WITH SAND: Medium brown, dry, 60% silt, 20% sand, 10% clay, 10% gravel, white rocks up to 2".	
						ML			
0	5,5,5	1.5			15			SILT: Medium brown, dry, 70% silt, 20% clay, 10% sand, poorly graded, fine to coarse, mostly fine, subangular.	
0	6,9,11	1.5			20			SILT WITH SAND: Medium brown, dry, 70% silt, 20% sand, poorly graded, dine to coarse, mostly fine, subangular, crushed up white rock, 10% cream mottling.	
0	5,7,9	1.5			25			SILT: Medium brown, dry, 80% silt, 20% sand, poorly graded, fine to medium.	
					30				

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

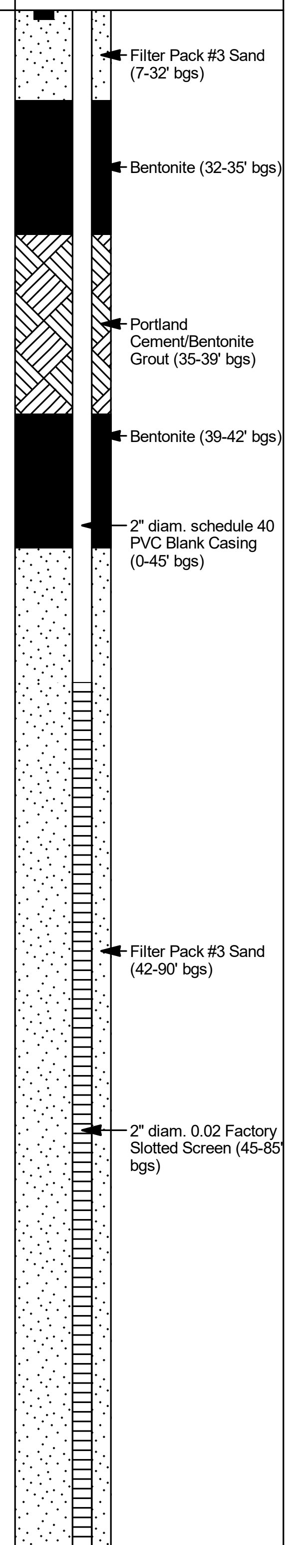
PROJECT NUMBER 258815 **BORING/WELL NUMBER** SB-2107/VE-48S/D

PROJECT NAME Omega OU1 **DATE DRILLED** September 10 and 13, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0	6,9,12	1.5						Same as above.	
0	11,13,15	1.5			35			Same as above, occasional very coarse sand, subrounded.	
0	12,12,14	1.5			40			Same as above.	
0	13,14,16	1.5			45			Same as above, 30% cream mottling.	
0	- -	1.5			50			Same as above, dark brown, 20% cream mottling.	
						ML			
0	12,14,15	1.5			55			Same as above.	
0	12,13,16	1.5			60			SILT: Light brown, dry, 100% silt.	
								SILT WITH SAND: Dark brown, dry, 80% silt, 20% sand, poorly graded, fine, 20% mottling.	
0	13,14,15	1.5						Same as above.	

WELL DIAGRAM



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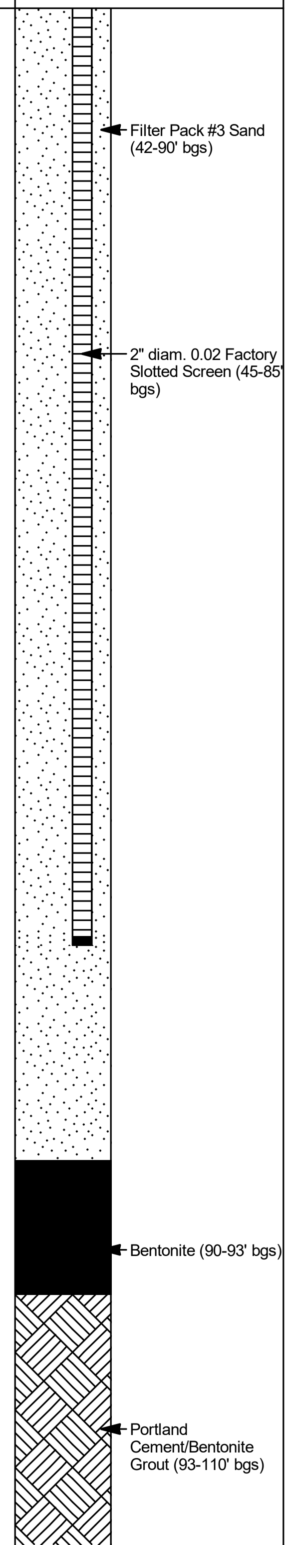
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2107/VE-48S/D
DATE DRILLED September 10 and 13, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	DEPTH (ft. BGL)	U.S.C.S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0	12,14,16	1.5		65		SILT: Medium brown, dry, 90% silt, 10% clay, cream and gray mottling.	
0	8,10,12	1.5		70		Same as above.	
0	9,11,13	1.5		75		Same as above.	
0	9,10,12	1.5		80		Same as above, 20% white mottling.	
					ML		
0	12,14,19	1.5		85		Same as above, dark brown.	
0.1	11,15,17	1.5		90		SILT: Dark brown, dry.	
						CLAYEY SILT: Dark brown, slightly moist, 60% silt, 40% clay, occasional coarse sand, fine gravel, occasional cream mottling, soft.	
	12,18,23,25	2					
0.3	19,19,17	2		95		SILT: Medium brown, moist, 80% silt, 20% clay, gray, very coarse sand stringer at 97', hard.	
	10,14,19,21	2				SILT: Dark brown, moist, 60% silt, 40% clay, softer.	

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815 **BORING/WELL NUMBER** SB-2107/VE-48S/D

PROJECT NAME Omega OU1 **DATE DRILLED** September 10 and 13, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
					100	ML		Same as above.		Portland Cement/Bentonite Grout (93-110' bgs)
0.2	14,19,22	1.5			105			Same as above.		
	15,19,22,27	2						Same as above.		
								Total Depth = 108.5 ft bgs	108.5	

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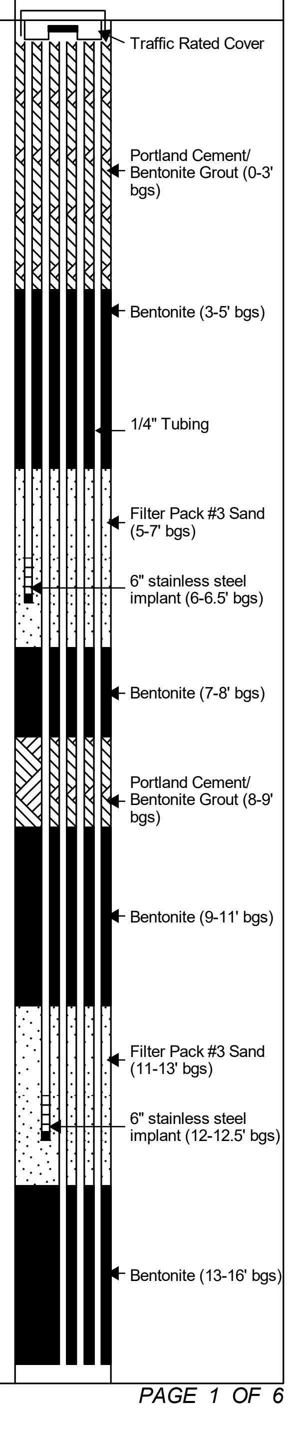
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	258815	**BORING/WELL NUMBER**	SB-2108/VMP-118A
PROJECT NAME	Omega OU1	**DATE DRILLED**	August 19, 2021
LOCATION	12508 Putnam Street	**CASING TYPE/DIAMETER**	Schedule 40 PVC 4"
DRILLING METHOD	Hollow Stem Auger	**SCREEN TYPE/SLOT**	0.02 Factory Slotted
SAMPLING METHOD	Split Spoon	**GRAVEL PACK TYPE**	#3 Monterey Sand
GROUND ELEVATION (FT MSL)		**GROUT TYPE/QUANTITY**	Portland Cement
TOP OF CASING (FT MSL)		**DEPTH TO WATER (FT BGS)**	Not encountered
LOGGED BY	Leslie Dybel	**GROUND WATER ELEVATION (FT MSL)**	

REMARKS Multi-Depth Vapor Monitoring Probe (VMP) with probes at 6, 12, 24, 40, 50, 60, 70 and 80 ft.

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
					0	ML		Hand auger to 10 ft bgs.	
0.1		0.5			5			SANDY SILT WITH GRAVEL: Medium brown, dry, 60% silt, 25% sand, poorly graded, fine to coarse, subangular, 15% gravel, poorly graded, up to 1", subangular. Roots.	
0.1	- -	1.5			10			As above.	
					15				

WELL DIAGRAM



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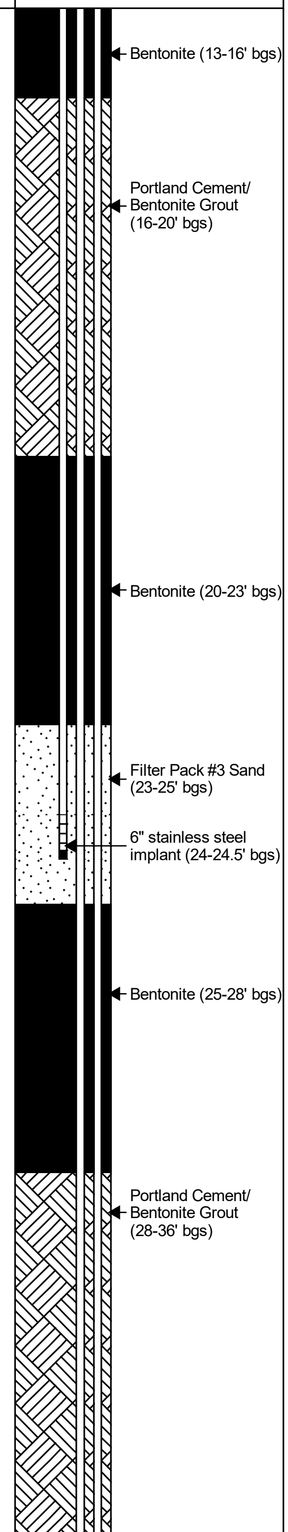
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
BORING/WELL NUMBER SB-2108/VMP-118A
PROJECT NAME Omega OU1
DATE DRILLED August 19, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.1	11,18,25	1.5				ML		SILT WITH SAND: Reddish brown, dry, 80% silt, 20% sand, poorly graded, fine to medium, 5% gravel, poorly graded, up to 0.5", subangular.	
0	14,20,27	1.5			20			SILT: Medium brown, dry, soft, 80% silt, 10% sand, poorly graded, fine to medium, 10% clay.	
0	8,12,16	1.5			25			As above.	
0	7,11,18	1.5			30			As above.	

WELL DIAGRAM



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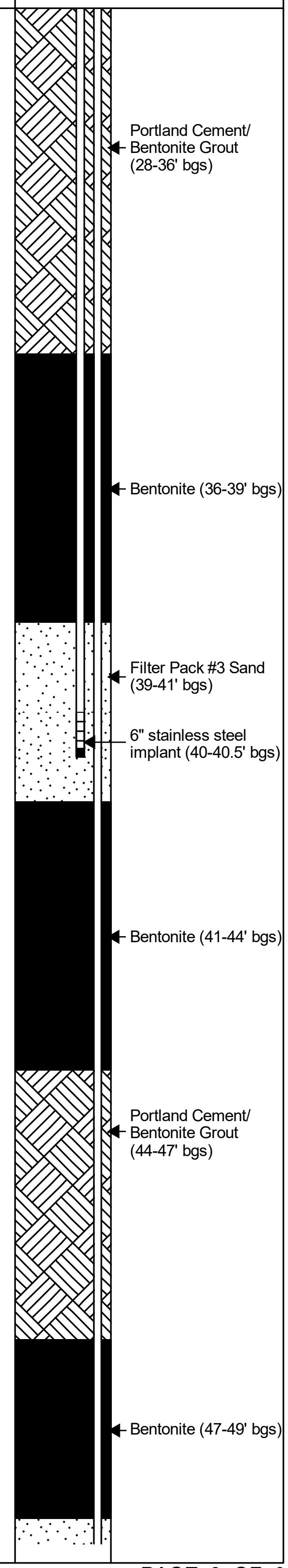
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815 **BORING/WELL NUMBER** SB-2108/VMP-118A
PROJECT NAME Omega OU1 **DATE DRILLED** August 19, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0	- -	1.5			35			As above.	
0	11,16,25	1.5			40			SILT WITH SAND: Medium brown, dry, soft, 70% silt, 25% sand, poorly graded, fine to medium, 5% gravel.	
0	9,14,19	1.5						SILT WITH SAND: Medium brown, dry, 70% silt, 20% sand, 10% clay.	
0	10,15,22	1.5			45	ML		SILT: Medium brown, dry, hard, 80% silt, 15% clay, 5% sand, poorly graded, coarse subangular.	

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815 **BORING/WELL NUMBER** SB-2108/VMP-118A
PROJECT NAME Omega OU1 **DATE DRILLED** August 19, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
										Filter Pack #3 Sand (49-51' bgs)
0	14,20,27	1.5			50			As above.		6" stainless steel implant (50-50.5' bgs)
						ML				
										See Log SB-2108B for construction details for the 60, 70, and 80 ft. probes
0	15,20,25	1.5			55			SILT: Medium brown, hard, 80% silt, 10% clay, 10% sand, poorly graded, mostly fine, occasional very coarse, subangular. 5% cream mottles.		
					60					
0	10,13,20	1.5						SILT: Medium brown, hard, 75% silt, 15% clay, 10% sand, poorly graded, mostly fine, occasional coarse, subangular. 10% cream mottles.		
0	8,13,17	1.5			65			SILT WITH SAND: Medium brown, soft, 75% silt, 15% sand, mostly fine, occasionally very coarse, 10% clay, gray mottles.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2108/VMP-118A
DATE DRILLED August 19, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0	10,12,18	1.5			70	ML		As above.		See Log SB-2108B for construction details for the 60, 70, and 80 ft. probes
0.2	11,16,23	1.5			75			As above.		
0	7,12,15	1.5			80			SILT: Medium brown, 80% silt, 20% clay, less gray mottles.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
BORING/WELL NUMBER SB-2108/VMP-118A
PROJECT NAME Omega OU1
DATE DRILLED August 19, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.2	13,17,24	1.5			85	ML		SILT: Medium brown, 80% silt, 10% clay, 10% sand, fine to coarse, 30% cream mottles.		See Log SB-2108B for construction details for the 60, 70, and 80 ft. probes
								SILT: Medium brown, 90% silt, 10% clay, no mottles, occasional fine gravel 0.2".		
0.3	7,13,16	1.5			90			Total Depth = 90 ft bgs	90.0	

NEWGINT OPOG_GINT_CORRECT.GPJ LAEWNN01.GDT 10/6/21

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	258815	**BORING/WELL NUMBER**	SB-2108/VMP-118B
PROJECT NAME	Omega OU1	**DATE DRILLED**	August 19, 2021
LOCATION	12508 Putnam Street	**CASING TYPE/DIAMETER**	Schedule 40 PVC 4"
DRILLING METHOD	Hollow Stem Auger	**SCREEN TYPE/SLOT**	0.02 Factory Slotted
SAMPLING METHOD	Split Spoon	**GRAVEL PACK TYPE**	#3 Monterey Sand
GROUND ELEVATION (FT MSL)		**GROUT TYPE/QUANTITY**	Portland Cement
TOP OF CASING (FT MSL)		**DEPTH TO WATER (FT BGS)**	Not encountered
LOGGED BY	Leslie Dybel	**GROUND WATER ELEVATION (FT MSL)**	

REMARKS Multi-Depth Vapor Monitoring Probe (VMP) with probes at 6, 12, 24, 40, 50, 60, 70 and 80 ft.

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
						ML		Hand auger to 10 ft bgs.		
0.1		0.5			5			SANDY SILT WITH GRAVEL: Medium brown, dry, 60% silt, 25% sand, poorly graded, fine to coarse, subangular, 15% gravel, poorly graded, up to 1", subangular. Roots.		See Log SB-2108A for construction details for the 6, 12, 24, 40, and 50 ft. probes
0.1	- -	1.5			10			As above.		
					15					

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
BORING/WELL NUMBER SB-2108/VMP-118B
PROJECT NAME Omega OU1
DATE DRILLED August 19, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.1	11,18,25	1.5				ML		SILT WITH SAND: Reddish brown, dry, 80% silt, 20% sand, poorly graded, fine to medium, 5% gravel, poorly graded, up to 0.5", subangular.		See Log SB-2108A for construction details for the 6, 12, 24, 40, and 50 ft. probes
0	14,20,27	1.5			20			SILT: Medium brown, dry, soft, 80% silt, 10% sand, poorly graded, fine to medium, 10% clay.		
0	8,12,16	1.5			25			As above.		
0	7,11,18	1.5			30			As above.		

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2108/VMP-118B
DATE DRILLED August 19, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0	- -	1.5			35			As above.		
										See Log SB-2108A for construction details for the 6, 12, 24, 40, and 50 ft. probes
0	11,16,25	1.5			40			SILT WITH SAND: Medium brown, dry, soft, 70% silt, 25% sand, poorly graded, fine to medium, 5% gravel.		
0	9,14,19	1.5						SILT WITH SAND: Medium brown, dry, 70% silt, 20% sand, 10% clay.		
0	10,15,22	1.5			45	ML		SILT: Medium brown, dry, hard, 80% silt, 15% clay, 5% sand, poorly graded, coarse subangular.		

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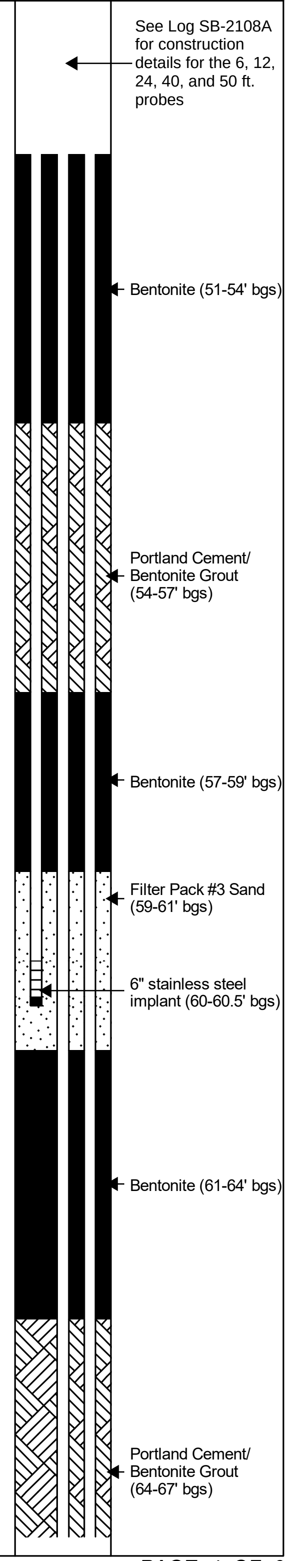
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
BORING/WELL NUMBER SB-2108/VMP-118B
PROJECT NAME Omega OU1
DATE DRILLED August 19, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0	14,20,27	1.5			50	ML		As above.	
0	15,20,25	1.5			55			SILT: Medium brown, hard, 80% silt, 10% clay, 10% sand, poorly graded, mostly fine, occasional very coarse, subangular. 5% cream mottles.	
					60				
0	10,13,20	1.5						SILT: Medium brown, hard, 75% silt, 15% clay, 10% sand, poorly graded, mostly fine, occasional coarse, subangular. 10% cream mottles.	
0	8,13,17	1.5			65			SILT WITH SAND: Medium brown, soft, 75% silt, 15% sand, mostly fine, occasionally very coarse, 10% clay, gray mottles.	

WELL DIAGRAM



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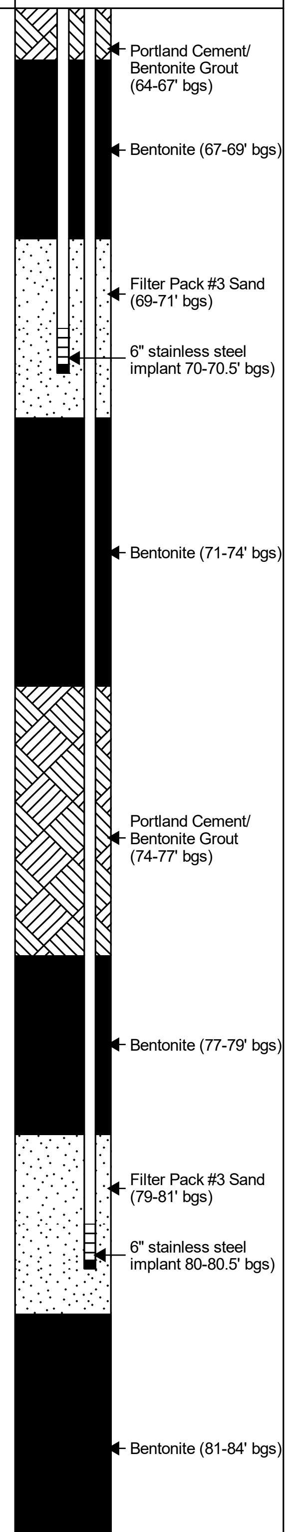
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2108/VMP-118B
DATE DRILLED August 19, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0	10,12,18	1.5			70	ML		As above.	
0.2	11,16,23	1.5			75			As above.	
0	7,12,15	1.5			80			SILT: Medium brown, 80% silt, 20% clay, less gray mottles.	

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2108/VMP-118B
DATE DRILLED August 19, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
										Bentonite (81-84' bgs)
0.2	13,17,24	1.5			85	ML		SILT: Medium brown, 80% silt, 10% clay, 10% sand, fine to coarse, 30% cream mottles.		Portland Cement/ Bentonite Grout (84-90' bgs)
								SILT: Medium brown, 90% silt, 10% clay, no mottles, occasional fine gravel 0.2".	90.0	
0.3	7,13,16	1.5			90			Total Depth = 90 ft bgs		

NEWGINT OPOG_GINT_CORRECT.GPJ LAEWNN01.GDT 10/6/21

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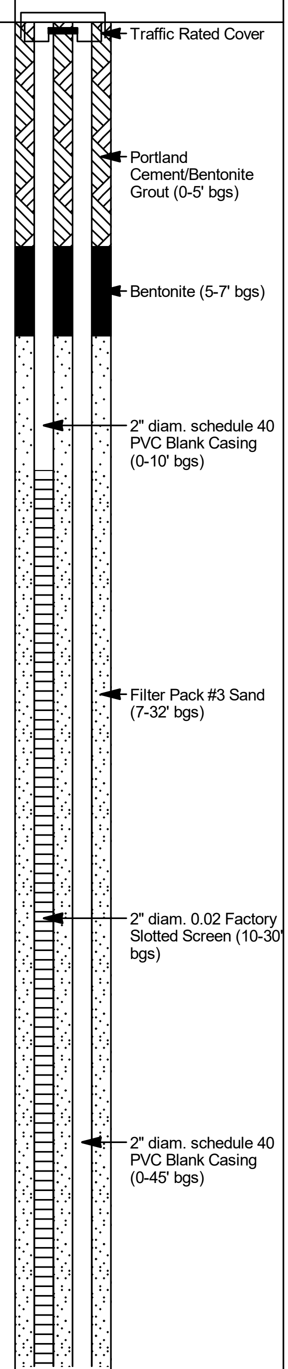
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	258815	**BORING/WELL NUMBER**	SB-2109/VE-49S/D
PROJECT NAME	Omega OU1	**DATE DRILLED**	August 18, 2021
LOCATION	12504 Putnam Street	**CASING TYPE/DIAMETER**	Schedule 40 PVC 2"
DRILLING METHOD	Hollow Stem Auger	**SCREEN TYPE/SLOT**	0.02 Factory Slotted
SAMPLING METHOD	Split Spoon	**GRAVEL PACK TYPE**	#3 Monterey Sand
GROUND ELEVATION (FT MSL)		**GROUT TYPE/QUANTITY**	Portland Cement
TOP OF CASING (FT MSL)		**DEPTH TO WATER (FT BGS)**	
LOGGED BY	Leslie Dybel	**GROUND WATER ELEVATION (FT MSL)**	
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
					0			Hand Auger to 10 ft bgs.	
0.5		0.5			5			SANDY SILT WITH GRAVEL: Light medium brown, dry, 55% silt, 30% sand, coarse, 15% gravel.	
0.1	9,11,14	1.5			10			SILT WITH SAND: Light medium brown, dry, 80% silt, 20% sand, poorly graded, fine, with cream mottles. 6 inches of dark brown clayey silt in half of core.	
						ML			
0.1	14,18,21	1.5			15			SILT: Medium brown, dry, 80% silt, 10% clay, 10% sand, poorly graded, coarse, subangular, 10% cream mottles, occasional gravel, subrounded, 0.05".	
0.1	29,50,-	1			20			As above, but no mottles and medium to coarse grained sand.	
0.2	14,22,27	1.2			25			SANDY SILT WITH GRAVEL: Medium brown, dry, 45% silt, 40% sand, poorly graded, fine to coarse, subangular, 15% gravel, well graded, up to 1.5", subrounded to subangular.	
					30				

WELL DIAGRAM



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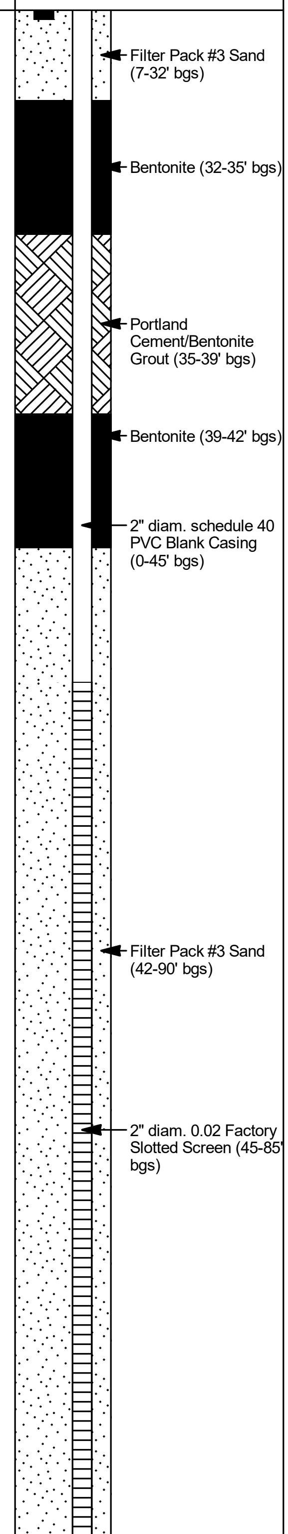
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
BORING/WELL NUMBER SB-2109/VE-49S/D
PROJECT NAME Omega OU1
DATE DRILLED August 18, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.4	15,22,29	1.5						SILT: Medium brown, dry, 80% silt, 10% clay, 10% sand, poorly graded, fine to medium, occasional gravel 0.7", subrounded, black mottle or material/grains.	
0.4	18,27,33	1.5			35			SILT: Medium brown, dry, 90% silt, 10% clay.	
0.4	19,27,33	1.5			40			As above.	
0.3	19,23,27	0.5			45	ML		SANDY SILT: Medium brown, dry, 60% silt, 40% sand.	
0.2	19,21,37	1.5			50			SILT: Medium brown, 90% silt 10% clay, hard, occasional mottle.	
0.3	18,22,30	1.5			55			As above.	
0.3	19,23,30	1.5			60			As above with 20% cream mottles and one 1.5" long angular gravel.	

WELL DIAGRAM



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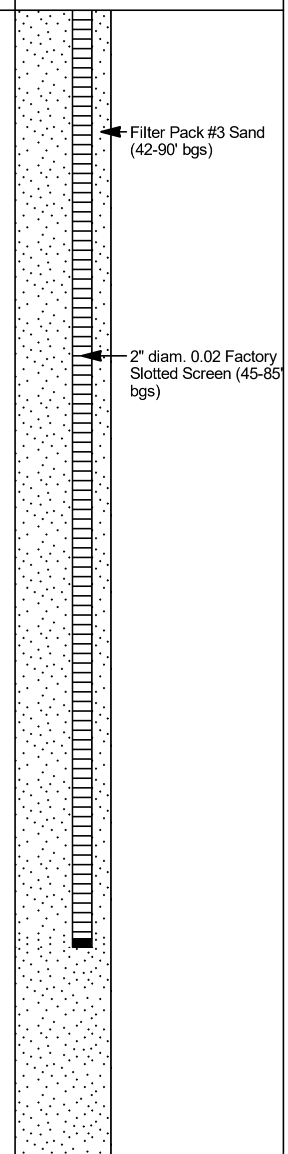
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2109/VE-49S/D
DATE DRILLED August 18, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.3	18,25,32	1.5			65			SILT: Reddish medium brown, 80% silt, 20% clay, softer with 20% cream mottles.	
0.1	21,29,34	1.5			70			As above.	
0.2	22,27,29	1.5			75			As above with gray mottles and occasional subangular gravel up to 0.4".	
0.4	15,18,20	1.5			80	ML		SILT WITH SAND: Reddish medium brown, dry, 85% silt, 15% sand, poorly graded, fine, softer with occasional subrounded 1" gravel.	
0.1	23,32,36	1.5			85			SILT WITH SAND: Medium brown, dry, 75% silt, 15% sand, 10% clay.	
								SILT: Dark medium brown, dry, 80% silt, 20% clay, hard, occasional subrounded 0.5" gravel.	90.0
0.2	24,34,40	1.5			90			Total Depth = 90 ft bgs	

WELL DIAGRAM



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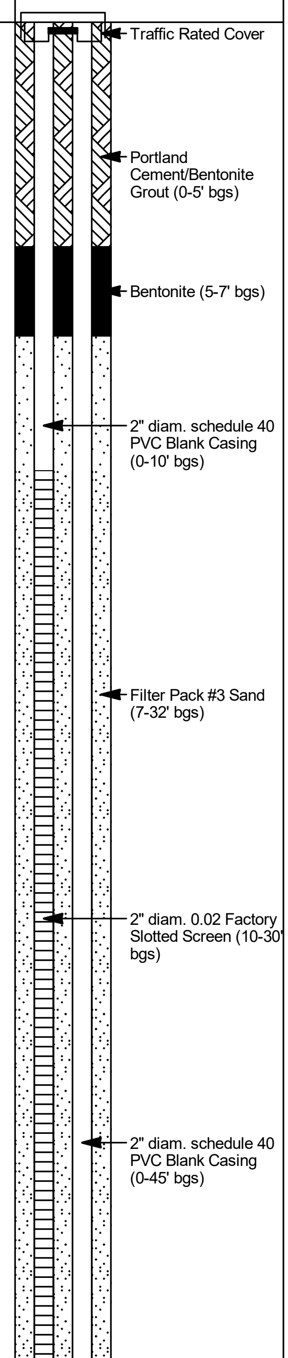
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	258815	**BORING/WELL NUMBER**	SB-2110/VE-50S/D
PROJECT NAME	Omega OU1	**DATE DRILLED**	August 17, 2021
LOCATION	12504 Putnam Street	**CASING TYPE/DIAMETER**	Schedule 40 PVC 2"
DRILLING METHOD	Hollow Stem Auger	**SCREEN TYPE/SLOT**	0.02 Factory Slotted
SAMPLING METHOD	Split Spoon	**GRAVEL PACK TYPE**	#3 Monterey Sand
GROUND ELEVATION (FT MSL)		**GROUT TYPE/QUANTITY**	Portland Cement
TOP OF CASING (FT MSL)		**DEPTH TO WATER (FT BGS)**	
LOGGED BY	Leslie Dybel	**GROUND WATER ELEVATION (FT MSL)**	
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
					0			Hand auger to 10 ft bgs.	
0.1		0.5			5	SM		SILTY SAND WITH GRAVEL: Medium brown, 65% sand, 20% silt, 15% gravel, fine to coarse, mostly coarse, well graded, subangular to subrounded.	
0.4	10,14,15	1.5			10			SILT WITH SAND: Medium brown, 80% silt, 20% sand, poorly graded, fine to medium.	10.0
1.1	10,11,15	1.5			15			SILT: Medium brown, 80% silt, 10% clay, 10% sand, poorly graded, fine, 10% cream mottles.	
						ML			
0.4	9,13,17	1.5			20			CLAYEY SILT: Dark medium brown, hard, 70% silt, 20% clay, 10% sand, poorly graded, coarse, subrounded. Occasional subangular 0.5" gravel.	
0.4	11,9,23	1.5			25			As above.	
					30				

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

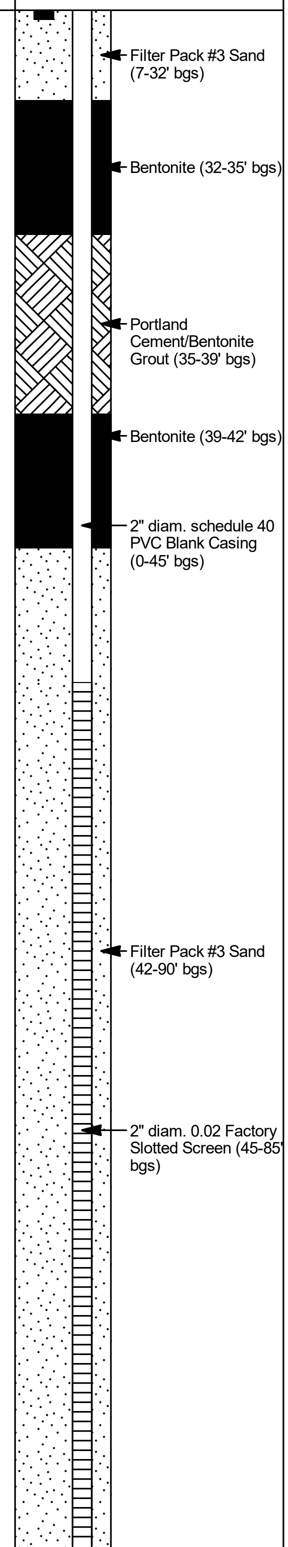
PROJECT NUMBER 258815 **BORING/WELL NUMBER** SB-2110/VE-50S/D

PROJECT NAME Omega OU1 **DATE DRILLED** August 17, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.4	13,17,21	1.5						SILT WITH SAND: Dark medium brown, 70% silt, 20% clay, 10% sand, poorly graded, coarse, subangular.	
0.4	17,25,33	1.5			35			SILT: Medium brown, sotfter than above, not mottles, 80% silt, 20% clay.	
0.5	18,25,31	1.5			40			SILT: Medium brown, 90% silt, 10% clay.	
0.3	14,18,22	1.5			45			As above.	
0.5	16,25,34	1.5			50	ML		As above.	
0.5	17,23,28	1.5			55			As above but very hard.	
0.7	19,21,37	1.5			60			As above.	

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2110/VE-50S/D
DATE DRILLED August 17, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.6	19,24,31	1.5			65			As above but softer.		Filter Pack #3 Sand (42-90' bgs)
0.4	19,23,34	1			70			SILT WITH SAND: Medium brown, soft, wet, 80% silt, 20% sand, poorly graded, fine to coarse, subangular. Occasional subrounded 0.5" gravel.		2" diam. 0.02 Factory Slotted Screen (45-85' bgs)
0.4	20,27,33	1.5			75	ML		SILT: Medium brown, hard, 70% silt, 20% clay, 10% sand, poorly graded, medium to coarse, subangular.		
0.6	19,27,32	1.5			80			As above with 10% mottles.		
0.6	20,27,39	1.5			85			SILT WITH SAND: Medium brown, soft, 85% silt, 15% sand, poorly graded, fine to coarse, mostly fine, 20% gray mottle/band and cream mottles.		
								SILT: Dark brown, hard, 80% silt, 10% clay, 10% sand, poorly graded, fine to medium, back mottles 10%.	90.0	
0.4	22,33,37	1.5			90			Total Depth = 90 ft bgs		

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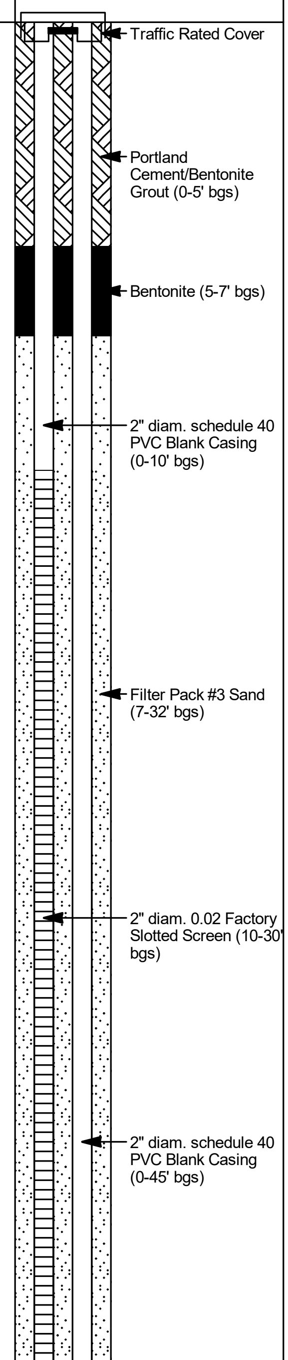
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	258815	**BORING/WELL NUMBER**	SB-2111/VE-51S/D
PROJECT NAME	Omega OU1	**DATE DRILLED**	August 2, 2021
LOCATION	12512 Putnam Street	**CASING TYPE/DIAMETER**	Schedule 40 PVC 2"
DRILLING METHOD	Hollow Stem Auger	**SCREEN TYPE/SLOT**	0.02 Factory Slotted
SAMPLING METHOD	Split Spoon	**GRAVEL PACK TYPE**	#3 Monterey Sand
GROUND ELEVATION (FT MSL)		**GROUT TYPE/QUANTITY**	Portland Cement
TOP OF CASING (FT MSL)		**DEPTH TO WATER (FT BGS)**	
LOGGED BY	Leslie Dybel	**GROUND WATER ELEVATION (FT MSL)**	
REMARKS			

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
					0			Hand auger to 5' bgs. Hit refusal, due to rock at 5'.	
0		0.5			5			SILT WITH SAND: Medium brown, dry, 85% silt, 15% sand, poorly graded, fine to coarse, subangular.	
0.4	9,11,17	1.5			10			As above.	
						ML			
0.4	8,12,16	1.5			15			CLAYEY SILT: Medium brown, dry, 70% silt, 30% clay.	
0.5	14,19,21	1.5			20			As above.	
0.6	15,20,22	1.5			25			As above with occasional poorly graded gravel, up to 1", subangular.	
					30				

WELL DIAGRAM



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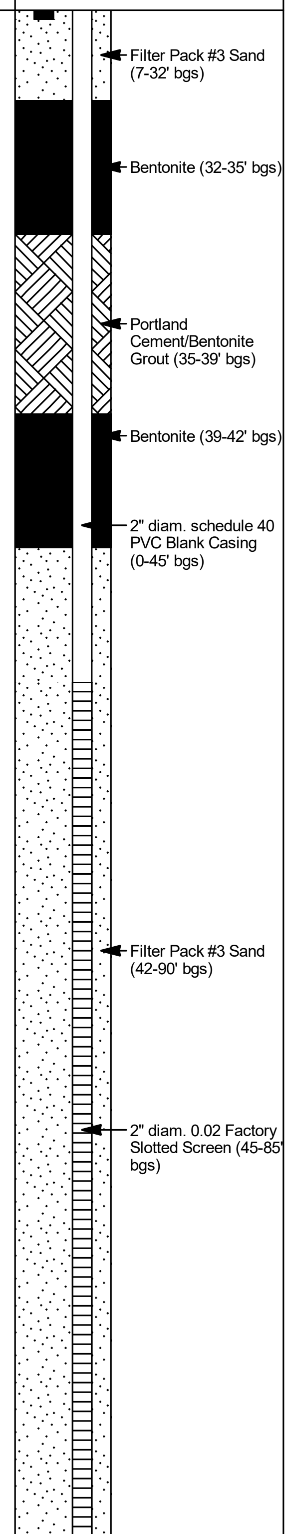
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815
PROJECT NAME Omega OU1
BORING/WELL NUMBER SB-2111/VE-51S/D
DATE DRILLED August 2, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.4	15,14,19	1.5						SILT WITH SAND: Medium brown, dry, 85% silt, 15% sand, poorly graded, fine to coarse, mostly fine, subangular.	
0.4	12,15,17	1.5			35			CLAYEY SILT: Medium brown, dry, 70% silt, 30% clay.	
0.6	10,12,16	1.5			40			SILT WITH SAND: Medium brown, dry, 85% silt, 15% sand, poorly graded, fine. Occasional poorly graded, subangular gravel up to 0.5".	
0.6	9,11,17	1.5			45	ML		SILT: Medium brown, dry, 90% silt, 10% sand, poorly graded, fine to coarse, mostly coarse, subangular, occasional cream colored burrows.	
0.5	16,19,25	1.5			50			As above with 20% cream colored mottling.	
0.5	13,17,23	1.5			55			As above.	
0.8	12,19,20	1.5			60			SANDY SILT: Light brown, dry, 70% silt, 20% sand, poorly graded, fine to medium, subangular, 10% gravel, poorly graded, up to 2", subrounded.	

WELL DIAGRAM



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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER 258815 **BORING/WELL NUMBER** SB-2111/VE-51S/D

PROJECT NAME Omega OU1 **DATE DRILLED** August 2, 2021

Continued from Previous Page

PID (ppm)	BLOW COUNTS	RECOVERY (feet)	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.6	10,13,21	1.5			65			SILT: Medium brown, dry, 90% silt, 10% sand poorly graded, fine to coarse, mostly coarse, subangular, 20% cream colored mottling.		Filter Pack #3 Sand (42-90' bgs)
0.7	14,19,24	1.5			70			SILT WITH CLAY: Medium brown, dry, 70% silt, 20% clay, 10% sand, poorly graded, fine, 20% cream mottling.		2" diam. 0.02 Factory Slotted Screen (45-85' bgs)
0.8	5,8,10	1.5			75			As above.		
0.5	9,16,19	1.5			80	ML		As above but hard with 20% mottling.		
0.5	4,7,9	1.5			85			SILT: Medium brown, dry, 90% silt, 10% sand, poorly graded, fine, 10% mottling.		
1	6,8,13	1.5			90			SILT: Medium brown, dry, 80% silt, 10% clay, 10% sand, poorly graded, fine, no mottling.	90.0	
								Total depth = 90 ft bgs		

ATTACHMENT 3
SOIL RESISTIVITY RESULTS

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove, CA 92841
Tel: (714)895-5494

Laboratory Job ID: 570-70614-1
Client Project/Site: Omega, Whittier

For:
CDM Smith, Inc.
46 Discovery
Suite 250
Irvine, California 92618

Attn: Will Weaver

Authorized for release by:
10/6/2021 2:50:44 PM

Tina Nguyen, Project Manager
(714)895-5494
tina.nguyen@eurofinset.com

1 2 3 4 5 6 7 8 9 10 11 12 13 14

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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SOIL RESISTIVITY USING THE TWO-ELECTRODE SOIL BOX METHOD

(ASTM G187)

Date: 10/6/2021
Client: Eurofins
Client Address: 7440 Lincoln Way, Garden Grove, CA 92841

Job Number: 1364 / 570-70614
Project Name: Omega Whittier
Report Number: 8668
Project Address: NR
Lab Number: 121958-121965

Date Sampled: 9/16/2021
Sampled By: Client
Date Submitted: 9/22/2021
Submitted By: Client
Meter Used: Nilsson Soil Resistance Meter
Material Source: NR
Tested By: Edwin Ocampo

Soil Resistivity Test Data

Lab ID	Client Sample No.	Sample Depth	Sample Test Temp.	Measured Resistance Ω	Calculated Resistance Ω
121958	OC-SB-15 (570-70614-89)	NR	69.9	2800	19376
121559	OC-SB-25 (570-70614-90)	NR	70.1	2000	13840
121960	OC-SB-35 (570-70614-91)	NR	40.5	2300	15916
121961	OC-SB-45 (570-70614-92)	NR	69.9	2100	14532
121962	OC-SB-55 (570-70614-93)	NR	71.2	4200	29064
121963	OC-SB-65 (570-70614-94)	NR	71.6	6200	42904
121964	OC-SB-75 (570-70614-95)	NR	69.4	2800	17360
121965	OC-SB-85 (570-70614-96)	NR	69.4	2700	18252

Respectfully Submitted,
NV5 West, Inc.

Joe Bouknight, PE
CMT Engineering Manager